Final EIS
for the Proposed Homeporting of Additional Surface Ships
At Naval Station Mayport, FL

Volume I: Final Environmental Impact Statement

November 2008

Prepared by:

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

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Final EIS
for the Proposed Homeporting of Additional Surface Ships At Naval Station Mayport, FL

Volume I: Final Environmental Impact Statement

UNCLASSIFIED

November 2008

Final Environmental Impact Statement
for the Proposed Homeporting of Additional Surface Ships at Naval Station Mayport, Florida
November 21, 2008

Lead Agency for the EIS: U.S. Department of the Navy

Cooperating Agencies: U.S. Army Corps of Engineers
U.S. Environmental Protection Agency

Title of the Proposed Action: Mayport Homeporting EIS

Proposed Action: To homeport additional surface ships at Naval Station Mayport, Florida

Designation: Final Environmental Impact Statement

Abstract: This Final Environmental Impact Statement (FEIS) has been prepared by the Department of the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code 4321 et seq.); the Council on Environmental Quality regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); and Chief of Naval Operations (CNO) Instruction 5090.1C *Environmental and Natural Resource Program Manual*. The proposed action evaluated in this FEIS is to homeport additional surface ships at Naval Station (NAVSTA) Mayport, Florida. The purpose of the proposed action is to ensure effective support of fleet operational requirements through efficient use of waterfront and shore side facilities at NAVSTA Mayport. The Navy needs to utilize the available facilities at NAVSTA Mayport, both pierside and shoreside, in an effective and efficient manner, thereby minimizing new construction. The CNO has directed U.S. Fleet Forces Command to review and assess a broad range of options for homeporting additional surface ships at NAVSTA Mayport. This FEIS reviews and assesses 12 action alternatives and the No Action Alternative. The action alternatives involve various types and numbers of ships including those types currently homeported at NAVSTA Mayport: cruisers, destroyers, and frigates, as well as additional types of ships identified by CNO, including amphibious assault ships, amphibious transport dock ships, dock landing ships, and a nuclear powered aircraft carrier. The proposed action includes only required activities necessary to prepare and operate NAVSTA Mayport for the proposed homeporting and does not include actions at other Navy bases. Depending on the action alternative, the proposed action may include dredging and disposal of dredged material, maintenance facilities improvements, utilities upgrades, wharf improvements, personnel support improvements, parking facilities and traffic improvements, or construction of nuclear propulsion plant maintenance facilities. Several alternatives could be implemented as early as 2009. Others could be fully implemented by 2014. The Navy's Preferred Alternative is to homeport a single CVN at NAVSTA Mayport (Alternative 4).

This FEIS addressed potential environmental impacts from activities that would occur under the No Action Alternative and the 12 action alternatives. Environmental resource topics evaluated include earth resources, land use, water resources, air quality, noise, biological resources, cultural resources, traffic, socioeconomics, general services, utilities, and environmental health and safety.

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EXECUTIVE SUMMARY

The United States Department of the Navy (DoN; Navy) is proposing to homeport additional U.S. Fleet Forces surface ships at Naval Station (NAVSTA) Mayport. NAVSTA Mayport is located in northern Florida east of Jacksonville along the St. Johns River and the Atlantic Ocean. NAVSTA Mayport maintains and operates facilities which provide support to the operations of deploying Navy ships, aviation units, and staff, both home based and transient. NAVSTA Mayport also provides logistic support for operating forces, dependent activities, and other commands as assigned.

The DoN is the lead agency for the proposed action. The U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) are serving as cooperating agencies, in accordance with 40 Code of Federal Regulations (CFR) 1501.6. The Navy prepared a Draft EIS (DEIS), made available for review by the public for 60 days beginning on 28 March 2008, and this Final Environmental Impact Statement (FEIS) to evaluate various homeporting options identified by the Chief of Naval Operations (CNO) and U.S. Fleet Forces Command (USFF). The DEIS and FEIS were prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality regulations implementing NEPA (40 CFR 1500-1508); and CNO Instruction (OPNAVINST) 5090.1C *Environmental and Natural Resource Program Manual*.

ES.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the proposed action is to ensure effective support of fleet operational requirements through efficient use of waterfront and shore side facilities at NAVSTA Mayport.

The 2001 Quadrennial Defense Review (QDR) called for the Department of Defense (DoD) to be capable of swiftly defeating aggression in overlapping conflicts worldwide. This required the Navy to modify its operational philosophy and to ensure it was capable of providing more warfighting assets, more quickly, to multiple locations. In Navy terms, this is called *surge capability* – or the ability to send trained naval battle forces *in addition to* those currently deployed. The Navy adopted the Fleet Response Plan (FRP) institutionalizing an enhanced naval surge capability.

Under the guidance of USFF, the fleet training cycle has been adjusted with refined maintenance, modernization, manning, and training processes to enable the fleet to consistently sustain a level of at least six surge capable carrier strike groups available within 30 days, and one additional strike group able to deploy within 90 days of an emergency order. Achieving this higher level of surge capability is a difficult task requiring Navy ships and Sailors to maintain an appropriate level of training (or *readiness*) for longer periods of time, while continuing to achieve ship maintenance and Sailor quality of life standards.

The Navy has developed plans for ashore infrastructure to ensure appropriate support of the FRP and the Navy's required operational battle force. While budgetary decisions drive the trend to consolidate or reduce the number of Navy bases overall, retaining bases in dispersed locations nationwide and worldwide supports the FRP and the operational battle force. Required capabilities at Navy bases are driven by strategic/geographic location and fleet operational readiness.

USFF has finite berthing capacity for surface ships in the turning basin at NAVSTA Mayport. NAVSTA Mayport also has established shore support capacity for ship maintenance and repair, as well as military personnel support facilities, not being fully utilized. The Navy will begin in 2010 to decommission frigates currently homeported at NAVSTA Mayport. The Navy needs to utilize the available facilities at NAVSTA Mayport, both pierside and shoreside, in an effective and efficient manner, thereby minimizing new construction. The CNO has directed USFF to review and assess a broad range of options for homeporting additional surface ships at NAVSTA Mayport.

Consideration of NAVSTA Mayport as a homeport for any of the classes of ships being discussed in the FEIS is based on the following:

- Use of NAVSTA Mayport helps preserve distribution of homeport locations and ports to reduce the risks to fleet resources in the event of natural disaster, manmade calamity, or attack by foreign nations or terrorists;
- Full use of NAVSTA Mayport preserves the capabilities of the Jacksonville Fleet Concentration Area, which supports U.S. based naval surge capability; and
- Utilization of NAVSTA Mayport helps optimize fleet access to naval training ranges and operating areas by retaining ship homeport locations within six hours transit time of local operating areas.

ES.2 DESCRIPTION OF THE PROPOSED ACTION

The proposed action evaluated in this FEIS is to homeport additional fleet surface ships at NAVSTA Mayport. This proposed action includes permanent assignment of surface ships and personnel. The Navy's FEIS reviews and assesses 12 action alternatives and the No Action Alternative:

- Cruiser/Destroyer (CRU/DES) homeporting (Alternative 1)

- Amphibious Assault Ship (LHD) homeporting (Alternative 2)
- Nuclear Powered Aircraft Carrier (CVN) capable (Alternative 3)
- CVN homeporting (Alternative 4)
- Amphibious Ready Group (ARG) homeporting (Alternative 5)
- Seven different combinations of the first four alternatives (Alternatives 6 – 12)
- No Action Alternative

The CVN homeporting and CVN capable alternatives differ. The CVN homeporting alternative would permanently assign the CVN and personnel to NAVSTA Mayport and provide adequate facilities to perform depot-level maintenance at that location. The CVN capable alternative does not involve the homeporting of a CVN, but would only provide adequate services, berthing, and access to a fully loaded CVN without draft restrictions for visits of up to 63 days per year, with no single visit lasting more than 21 days (approximately 3 visits per year). (Depot-level maintenance facilities are not required if the CVN is not homeported). More detailed descriptions of each alternative are provided in Section ES.3.

The CNO identified homeporting options in Alternatives 1 through 5, and he directed USFF to review and assess a broad range of options for homeporting additional surface ships at NAVSTA Mayport (resulting in Alternatives 6 – 12). The proposed action could involve the relocation of existing fleet ships to NAVSTA Mayport or assignment of newly acquired fleet ships to NAVSTA Mayport. The proposed action includes only actions necessary to prepare and operate NAVSTA Mayport for the proposed homeporting and does not include actions at other Navy bases.

Depending on the alternative selected, the proposed action may include:

- Maintenance facilities improvements
- Utilities upgrades
- Personnel support improvements
- Wharf improvements
- Parking facilities and traffic improvements
- Construction of CVN nuclear propulsion plant maintenance facilities
- Dredging and disposal of dredged material

ES.3 DESCRIPTION OF ALTERNATIVES

The types of ships to be addressed in this FEIS include those types currently homeported at NAVSTA Mayport: cruisers (CGs), destroyers (DDGs), and frigates (FFGs), as well as additional types of ships identified by CNO, including LHDs, amphibious transport dock ships (LPDs), dock landing ships (LSDs), and a CVN. The type and number of ships included in each alternative were either specified by CNO or defined by fleet type commanders. The number of additional ships proposed for each alternative is in addition to the ships currently homeported at NAVSTA Mayport. The alternatives considered in this FEIS could be implemented between the years of 2009 and 2014, depending upon deployment schedules of ships or construction schedules for facilities associated with each alternative. As such, the year 2014 represents the end state, or the year by which all alternatives could be completely implemented.

While the alternatives include a wide range of scenarios, for ease of description, the 12 action alternatives are grouped into three fundamental categories based on common components. The categories include:

- **Group 1 – Alternatives Involving Homeporting of Surface Ships (Non-CVN)**. These alternatives involve only homeporting of surface ships and require minimal construction activities. The four alternatives in Group 1 include:
    - Alternative 1: CRU/DES Homeporting ("CRU/DES" is the Navy's designation for large surface combatants that may include cruisers, destroyers, or frigates)
    - Alternative 2: LHD Homeporting
    - Alternative 5: ARG Homeporting
    - Alternative 6: CRU/DES Homeporting and LHD Homeporting
- **Group 2 – Alternatives Involving CVN Capability**. Each alternative involves a dredging project required to allow access and berthing of one CVN without draft restrictions. While no CVN would be homeported under any of the Group 2 alternatives, three of the four alternatives in this group also include homeporting of other surface ships. The four alternatives in Group 2 include:
    - Alternative 3: CVN Capable
    - Alternative 7: CRU/DES Homeporting and CVN Capable
    - Alternative 9: LHD Homeporting and CVN Capable
    - Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable

- **Group 3 – Alternatives Involving Homeporting of a CVN**. Each alternative includes homeporting a CVN, a dredging project (same as Group 2 alternatives), and construction of CVN nuclear propulsion plant maintenance facilities. Homeporting of other surface ships is included in all but one alternative. The four alternatives in Group 3 include:
  - Alternative 4: CVN Homeporting
  - Alternative 8: CRU/DES Homeporting and CVN Homeporting
  - Alternative 10: LHD Homeporting and CVN Homeporting
  - Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting.

ES.3.1 Summary of Ship and Personnel Loading under each Alternative

Table ES-1 summarizes the additional ships, ships crew, and other personnel proposed for each alternative, including officer, enlisted, and civilian personnel assigned to the Afloat Training Group, Southeast Regional Maintenance Center (SERMC), or CVN nuclear propulsion plant maintenance facilities. The number of additional ships and personnel proposed for each alternative is in addition to the ships currently homeported and personnel currently stationed at NAVSTA Mayport. This table reflects the total number of additional personnel proposed for reassignment to NAVSTA Mayport, but does not consider deployment factors and is not representative of base loading (i.e., the number of personnel that would be present at NAVSTA Mayport at any one time). Base loading estimates that consider these proposed additional ships and personnel as well as other factors affecting the base population are depicted in Figures ES-1 and ES-2.

Figure ES-1 summarizes the number of ships that would be homeported at NAVSTA Mayport in the end state year of 2014 in relation to the baseline year of 2006. Figure ES-2 summarizes the average net daily population in the end state year in relation to the baseline year of 2006. The average net daily population considers the total number of personnel assigned to NAVSTA Mayport in a given year and applies a deployment factor as appropriate to provide an estimated average daily population. For example ships' crews are expected to be in port only 73 percent of the time, whereas non-deploying military and civilian staff likely would be present year-round. Using information regarding future base population changes (i.e., organizational changes or ship decommissioning) and projecting the mix of ship types and numbers homeported in the future, allows for the estimation of average net daily population at NAVSTA Mayport as depicted in Figure ES-2.

Table ES-1 Ships, Crew, and Other Personnel Associated with Each Alternative

Alternative		Ship Type	No. Ships	Ships Crew[1]			Other Personnel[2]				Total Personnel For Alternative[3]
				Officer	Enlisted	Total	Officer	Enlisted	Civilian	Total	
Group 1 -- Alternatives Involving Homeporting of Surface Ships (Non-CVN)											
1	CRU/DES Homeporting	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**	13	22	20	**55**	**1,790**
2	LHD Homeporting	LHD	2	146	2,018	**2,164**	0	5	10	**15**	**2,179**
5	ARG Homeporting	LHD	1	73	1,009	**1,082**					
		LPD	1	32	364	**396**					
		LSD	1	19	291	**310**	17	27	10	**54**	**1,842**
6	CRU/DES Homeporting and LHD Homeporting[4]	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**	13	26	30	**69**	**3,968**
Group 2 -- Alternatives Involving CVN Capability											
3	CVN Capable	CVN	0	0	0	0	0	0	0	0	0
7	CRU/DES Homeporting and CVN Capable	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		CVN	0	0	0	**0**	13	22	20	**55**	**1,790**
9	LHD Homeporting and CVN Capable	LHD	2	146	2,018	**2,164**					
		CVN	0	0	0	**0**	0	5	10	**15**	**2,179**
11	CRU/DES Homeporting and LHD Homeporting and CVN Capable	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**					
		CVN	0	0	0	**0**	13	26	30	**69**	**3,968**
Group 3 -- Alternatives Involving Homeporting of a CVN											
4	CVN Homeporting	CVN	1	159	2,981	**3,140**	0	0	50	**50**	**3,190**
8	CRU/DES Homeporting and CVN Homeporting	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**	13	22	20	**55**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**4,980**
10	LHD Homeporting and CVN Homeporting	LHD	2	146	2,018	**2,164**	0	5	10	**15**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**5,369**
12	CRU/DES Homeporting and LHD Homeporting and CVN Homeporting	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**	13	26	30	**69**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**7,158**

Notes: [1] Ship's Crew numbers are approximations and are subject to change

[2] Other Personnel includes officer, enlisted, and civilian personnel assigned to the Afloat Training Group or to ship maintenance organizations.

[3] Total Personnel reflects additional personnel proposed for each alternative. This total does not consider deployment factors and is not representative of base loading (i.e., the number of personnel that would be present at NAVSTA Mayport). Base loading estimates that consider the proposed additional personnel and other factors affecting the net daily population are discussed in Section 2.1 of the FEIS. Figure ES-2 summarizes projected average net daily populations.

[4.] Enlisted Other Personnel (26) is not the sum of CRU/DES (22) and LHD (5) alternatives because of Afloat Training Group personnel efficiency in combining alternatives.

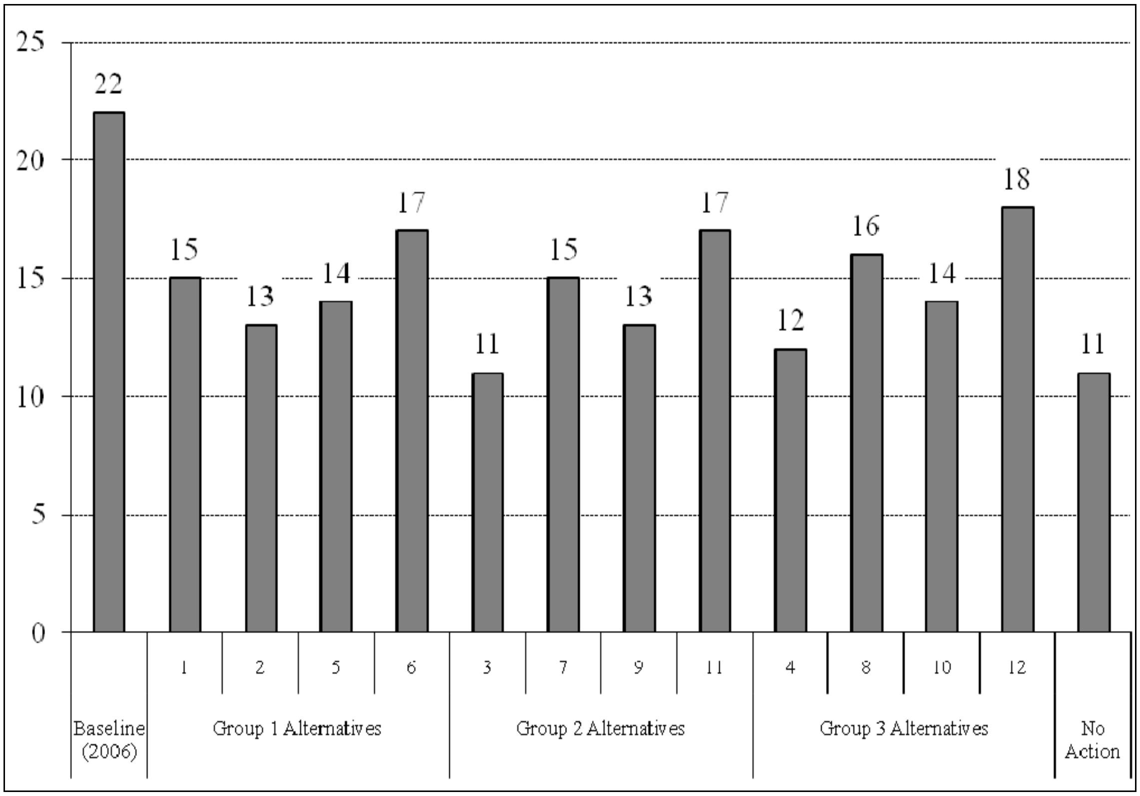

Figure ES-1: Number of Ships Homeported at NAVSTA Mayport under Each Alternative End State (2014) as Compared to Baseline (2006)

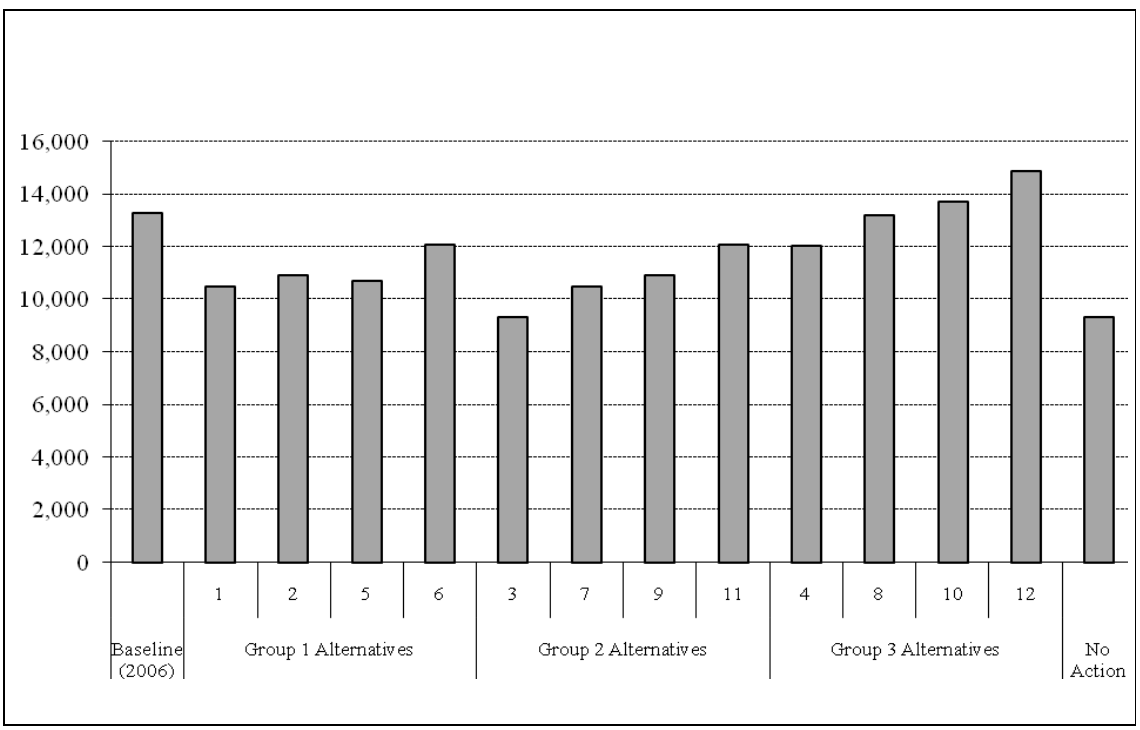

Figure ES-2: Net Daily Population at NAVSTA Mayport under Each Alternative End State (2014) as Compared to Baseline (2006)

The baseline year 2006 best represents recent operations at NAVSTA Mayport, as 2006 was the final full year of operations for the conventionally powered aircraft carrier, U.S.S. JOHN F. KENNEDY, prior to its decommissioning in 2007. The number of ships homeported and the average net daily population decreased from the 2006 baseline due to decommissioning of the KENNEDY in 2007; these numbers would continue to decrease commensurate with scheduled decommissioning (in the years 2010 through 2014) of 10 FFGs currently homeported at NAVSTA Mayport. The net daily population numbers are also affected by a separate action that is occurring independent of the ships homeporting analysis in this FEIS: the SERMC is downsizing by approximately 539 personnel between the baseline (2006) and 2009. SERMC will retain the capability to service all ships associated with homeporting alternatives (except for specialized maintenance of CVN nuclear propulsion plant associated with Group 3 alternatives). The No Action Alternative represents no proposed additional homeporting, and reflects the projected ship and population decreases through 2014 as described above.

ES.3.2 Group 1: Alternatives involving Homeporting of Surface Ships (Non-CVN)

Elements Common to Group 1 Alternatives

The following fundamental components are common to all Group 1 alternatives:

- Maintenance requirements of additional ships would be served by SERMC and existing shipyards at NAVSTA Mayport;
- There is adequate space, including full utility services requirements, to provide berthing by 2014 for all ships considered under each alternative;
- Homeporting of ships considered under each alternative could be implemented as early as 2009 and has been assumed for planning purposes; and
- CVN visits could continue to occur subject to current restrictions (see Section ES.3.3).

Alternative 1: CRU/DES Homeporting

Under Alternative 1, an additional Destroyer Squadron (DESRON) staff and five additional ships (four DDGs and one FFG) would be homeported at NAVSTA Mayport. The five ships could arrive for homeporting as early as 2009, but it should be noted that the proposed FFG also could be decommissioned as early as 2014. As part of this alternative, a new DESRON headquarters building (6,000, square feet [sf]) would be constructed at a previously disturbed site at NAVSTA Mayport that currently is vacant and intermittently used by contractors as a laydown area.

Alternative 2: LHD Homeporting

Under Alternative 2, two LHDs would be homeported at NAVSTA Mayport. The number of ships homeported would be 23 in 2009, but would decrease to 13 by 2014. The current facilities infrastructure at NAVSTA Mayport would support the alternative without requiring new support facilities.

Alternative 5: ARG Homeporting

Under Alternative 5, an amphibious squadron (PHIBRON) staff and three additional ships (one LHD, one LPD, and one LSD) would be homeported at NAVSTA Mayport. A new approximately 9,000-sf PHIBRON Command Building would be constructed at the same previously disturbed site as the Alternative 1 DESRON headquarters building.

Alternative 6: CRU/DES Homeporting and LHD Homeporting

Alternative 6 combines Alternatives 1 and 2 homeporting options. Additional DESRON staff and a total of seven additional ships (four DDGs, one FFG, and two LHDs) would be homeported at NAVSTA Mayport. The seven ships could arrive for homeporting as early as 2009, but it should be noted that the proposed FFG also could be decommissioned as early as 2014. The number of ships would increase from 22 to 28 by 2009, but would decrease to 17 by 2014. As with Alternative 1, a new 6,000 sf DESRON headquarters building would be constructed at the previously disturbed site at NAVSTA Mayport.

ES.3.3 Group 2: Alternatives involving CVN Capability

Elements Common to Group 2 Alternatives

In addition to the elements that are common to all Group 1 alternatives, the following fundamental components are common to all Group 2 alternatives:

- Dredging of the NAVSTA Mayport turning basin and entrance channel and federal navigation channel (Jacksonville Harbor Bar Cut) over a period of 12 to 18 months beginning in 2011 and completed in 2012;
- Disposal of approximately 5.2 million cubic yards (cy) of dredged material; and
- Accommodation of a visiting CVN with no draft restrictions as early as 2012 for up to 63 days per year, with no single visit lasting more than 21 days (approximately 3 visits per year).

Under all alternatives in this grouping, necessary improvements are required to make NAVSTA Mayport a CVN capable port. For this FEIS, CVN capable refers to the capability of NAVSTA Mayport to provide adequate services, berthing, and access to a fully loaded CVN without draft restrictions. For all alternatives in this grouping, no CVNs would be homeported at NAVSTA Mayport. The CVN could begin visiting NAVSTA Mayport without draft restrictions as early as 2012, contingent upon the completion of a dredging project described below. Other ships proposed for homeporting as part of the Group 2 alternatives could arrive as early as 2009. Historically, a CVN visits NAVSTA Mayport approximately once per year for less than 3 days per visit under current draft restrictions. For the purposes of this FEIS, it is estimated that the CVN may visit NAVSTA Mayport for up to 63 days per year, with no single visit lasting greater than 21 days (approximately 3 visits per year).

In general, CVN capable ports require increased shore electrical power, stronger wharf and mooring structures, and access to the port that is unrestricted by water depths. At NAVSTA Mayport, Wharf C-2 currently provides the necessary berthing depth (-50 feet [ft] Mean Lower Low Water [MLLW]), shore electrical power station (4,160-volt) and mooring structures (Type II mooring dolphins) required to accommodate a non-homeported CVN. NAVSTA Mayport, however, is not currently accessible to a fully loaded CVN without draft restrictions. All aircraft carriers require a minimum of 6 ft beneath the keel to ensure cooling and firefighting system intakes do not get clogged or damaged by mud and debris from the sea and river bottom. A dredge depth of -50 ft MLLW is necessary for CVNs to meet this requirement under all ship loading and tidal conditions. The current water depth for the NAVSTA Mayport turning basin and entrance channel and the portion of the federal navigation channel to be used (Jacksonville Harbor Bar Cut) is maintained at approximately -42 ft MLLW although some portions of the federal navigation channel are naturally deeper than -42 ft MLLW. The -42 ft MLLW depth is adequate for safe transit of a CVN only if the ship is loaded to significantly less than its full capacity in order to reduce its draft, and/or the transiting occurs during periods of high tide.

To accommodate the CVN capable alternative, which provides unrestricted access, Group 2 alternatives propose dredging to the required depth of -50 ft MLLW at the NAVSTA Mayport turning basin and entrance channel and Jacksonville Harbor Bar Cut federal navigation channel. (The actual deepening would be to the -50 ft MLLW required project depth, plus -2 ft of advance maintenance [where necessary for fast shoaling areas], plus -2 ft of allowable overdepth for a maximum total project depth of -54 ft MLLW). This proposed deepening would involve the excavation of an estimated 5.2 million cy of dredged material. Note the 5.2 million cy volume is less than what was estimated in the DEIS released in March 2008. The DEIS proposed advance maintenance of -2 ft MLLW for all project areas, but based on hydrodynamic modeling results completed after publication of the DEIS and historic USACE maintenance dredging information, only three areas of the proposed project are identified as needing advance maintenance in this FEIS. The reduction in advance maintenance requirements reduces the estimated volume of material to be dredged from 5.7 million cy to 5.2 million cy.

The method of dredging could be a combination of mechanical and hydraulic dredging equipment that would be determined by the USACE permit and the dredging contractor. The dredging project would be implemented in 2011 and occur over the course of 12 to 18 months. Dredging operations typically occur continuously, up to 24 hours per day, seven days per week. The methods of dredging analyzed in this FEIS provide the capability to place sediment within an USEPA-managed ocean dredged material disposal site (ODMDS), as well as any bed leveling techniques used for smoothing of post-dredging bottom contours. Clamshell and hopper dredges are most typically used in the vicinity of NAVSTA Mayport, and larger cutterhead equipment has also been used in the federal navigation channel for some projects. Limestone or bedrock is not expected in the dredging area nor was it identified in extensive sampling of the project area sediment, thus the use of blasting techniques is not anticipated.

Options for dredged material disposal depend on several factors, including availability of approved placement sites and the quantity, grain size, and chemical characteristics of the sediment to be dredged. The Navy would dispose of the dredged material from the proposed deepening project in the ocean in USEPA-managed ODMDSs as it does for its periodic maintenance dredging projects. While the Jacksonville ODMDS (located approximately 5.5 nautical miles southeast of the NAVSTA Mayport turning basin) has supported past dredge disposal for NAVSTA Mayport, the Fernandina ODMDS (located about 8.5 nautical miles northeast of the NAVSTA Mayport turning basin) also is proposed. The Navy evaluated the feasibility of utilizing existing or potential new upland dredged material disposal sites and concluded that there was no viable upland disposal option for the total volume of dredged material envisioned in the proposed deepening project. As a consequence, ocean disposal is the most suitable means of disposal.

As part of the DEIS, the Navy conducted a preliminary sampling and testing program to assess physical and chemical composition of the sediment to be dredged. These preliminary results indicated the sediments would meet the USEPA parameters for ocean disposal. This analysis was performed as part of the Marine Protection, Research, and Sanctuaries Act Section 103 Evaluation that is part of the permit process. The evaluation and required biological and bioassay testing followed the procedures outlined in the 1991 USEPA/USACE *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, commonly referred to as the “Green Book” and 1993 Regional Implementation Manual. As presented in this FEIS, based on additional analysis of sediments to be dredged performed following publication of the DEIS, USACE determined that more than 4.8 million cy of the material meets the suitability criteria for ocean disposal. One of eight zones established for sediment sampling for the proposed project failed slightly the bioassay portion of the testing. This zone represents approximately 315,000 cy of the total 5.2 million cy project. As the test results were very close to passing the criteria (test results were 70 percent survival rate, but 71 percent survival rate is needed for a passing test), this zone of the proposed dredging area is being retested for the bioassay portion of the testing. The USEPA must endorse the determination that materials are suitable prior to disposal in Jacksonville ODMDS or Fernandina ODMDS. In the event that any dredged material is discovered not to meet USEPA parameters for ocean disposal, it would be disposed of at existing permitted upland disposal sites in the vicinity of NAVSTA Mayport.

The Navy evaluated the potential to minimize the volume of material disposed of in the ODMDS by placing any significant quantities of materials meeting State beach compatibility requirements on local beaches. Investigation conducted in support of the DEIS identified sand layers in the NAVSTA Mayport entrance channel (110,000 cy) and in the federal navigation channel (115,000 cy) area to be dredged that appear to be thick enough for further consideration as potential beach-compatible sand. This approximately 225,000 cy of identified sand layers represents the maximum amount of potential beach compatible sand. Since publication of the DEIS, USACE conducted additional targeting clusters of vibracore samples in the locations potentially containing thick enough sand layers in the outer NAVSTA Mayport entrance channel and the federal navigation channel. USACE concluded that it was not feasible to separate the limited beach quality sand lenses (i.e., layers) from the non-beach quality material.

It was determined that material did not meet the criteria for nearshore placement (under Florida Administrative Code 62B-41.007.5[k] and 62B-41.005) and no nearshore placement area has been previously designated in Duval County.

Following construction dredging, there would be long-term dredge maintenance requirements to maintain the increased depth created by the construction dredge project. The Navy currently removes approximately 900,000 cy from the NAVSTA Mayport turning basin and entrance channel every two years for maintenance dredging. The USACE currently removes approximately 300,000 cy from the outer portion of the federal navigation channel every three years for maintenance dredging (amounting to an annual average of 550,000 cy). Due to increased depth, ongoing maintenance dredging requirements throughout the dredge project area would be expected to increase approximately 5 percent overall, or an additional 27,500 cy annually.

Alternative 3: CVN Capable

Under Alternative 3, the CVN could begin visiting NAVSTA Mayport without restrictions as early as 2012. When the CVN visits, the ships crew (of 3,140) would temporarily increase the population of NAVSTA Mayport. No land-based construction would occur under this alternative.

Alternative 7: CRU/DES Homeporting and CVN Capable

Alternative 7 combines Alternatives 1 and 3 CRU/DES homeporting and CVN capable options. Additional DESRON staff and a total of five additional ships (four DDGs and one FFG) would be homeported at NAVSTA Mayport. The five ships could arrive for homeporting as early as 2009, but it should be noted that the proposed FFG also could be decommissioned as early as 2014. As with the other alternatives including CRU/DES Homeporting, a new DESRON headquarters building would be constructed at the same previously disturbed site at NAVSTA Mayport as identified for Alternative 1.

Alternative 9: LHD Homeporting and CVN Capable

Alternative 9 combines Alternatives 2 and 3 homeporting and CVN capable options. A total of two additional ships (two LHDs) would be homeported at NAVSTA Mayport. No land-based construction would be required for this alternative.

Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable

Alternative 11 combines Alternatives 1, 2, and 3 homeporting and CVN capable options. A total of seven additional ships (four DDGs, one FFG, and two LHDs) would be homeported at NAVSTA Mayport. A maximum of 28 ships would be homeported at NAVSTA Mayport in 2009, but by 2014, the number of ships homeported would be 17. It should be noted that the proposed FFG would arrive as early as 2009, but it could also be decommissioned as early as 2014. As with the other alternatives that include CRU/DES Homeporting, Alternative 11 includes the construction of a new DESRON headquarters building as described for Alternative 1.

ES.3.4 Group 3: Alternatives involving Homeporting of a CVN

Elements Common to Group 3 Alternatives

The following fundamental components are common to all Group 3 alternatives:

- A CVN would be homeported at NAVSTA Mayport;

- Dredging and dredged material disposal would occur as discussed for Group 2 alternatives;
- CVN nuclear propulsion plant maintenance facilities, consisting of three main components: Controlled Industrial Facility (CIF), Ship Maintenance Facility (SMF), and Maintenance Support Facility (MSF), would be constructed at a previously disturbed site at NAVSTA Mayport that currently provides parking;
- Wharf F would be improved to provide berthing for a CVN during maintenance periods, including upgrading shore power utility systems and installing Type III heavy-weather moorings;
- The Massey Avenue corridor would be improved to better accommodate traffic flow near Wharf F;
- Parking structures would be constructed at previously disturbed sites at NAVSTA Mayport that currently support surface parking;
- Maintenance requirements of additional ships would be served by SERMC and existing shipyards at NAVSTA Mayport, with the exception of maintenance on the CVN nuclear propulsion system, which would be conducted by personnel at the proposed CVN nuclear propulsion plant maintenance facilities; and
- Improvements would be phased as follows:
  - Dredging started in 2011 and completed in 2012 (approximately 18 months)
  - Wharf F improvements started in 2011 and completed in 2013 (approximately 24 months)
  - Parking improvements started in 2011 and completed in 2013 (approximately 24 months)
  - Road improvements started 2011 and completed in 2013 (approximately 24 months)
  - CVN nuclear propulsion plant maintenance facilities (CIF/SMF/MSF) construction started in 2011 and completed in 2014 (approximately 33 months), followed by equipment outfitting also completed in 2014 (approximately 9 months).
  - Arrival of CVN for homeporting as early as 2014. This date is dependent upon the completion of CIF/SMF/MSF facilities construction and outfitting, which would occur as early as 2014. For purposes of analysis in this FEIS, projected ship and personnel loading is based upon 2014 arrival.

Alternative 4: CVN Homeporting

Under Alternative 4, one CVN could be homeported at NAVSTA Mayport as early as 2014. The CVN would be berthed at Wharf C-2 when not undergoing maintenance. During periods of CVN maintenance and repair, the homeported CVN would be berthed at Wharf F, NAVSTA Mayport's general maintenance wharf.

Alternative 8: CRU/DES Homeporting and CVN Homeporting

Alternative 8 combines Alternatives 1 and 4 homeporting options. Additional DESRON staff and a total of six additional ships (four DDGs, one FFG, and one CVN) would be homeported at NAVSTA Mayport. The DDGs and FFG could be homeported as soon as 2009 and the CVN could arrive as early as 2014. It should be noted that the proposed FFG, however, also could be decommissioned as early as 2014. The number of ships homeported would increase from 22 to 26 in 2009, and then steadily decrease to 16 by the 2014 end state year.

Alternative 10: LHD Homeporting and CVN Homeporting

Alternative 10 combines Alternatives 2 and 4 homeporting options. A total of three additional ships (two LHDs in 2009 and one CVN as early as 2014) would be homeported at NAVSTA Mayport.

Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting

Alternative 12 combines Alternatives 1, 2, and 4 homeporting options. A total of eight additional ships (four DDGs, one FFG, and two LHDs arriving as early as 2009, and one CVN arriving as early as 2014) would be homeported at NAVSTA Mayport. It is important to note that the proposed FFG also could be decommissioned as early as 2014. The number of ships homeported would increase in 2009 to 28 and decrease to 18 by 2014.

Alternative 13: No Action Alternative

Under the No Action Alternative, no additional fleet surface ships would be homeported at NAVSTA Mayport. In 2014, there would be 11 fleet surface ships homeported at NAVSTA Mayport. NAVSTA Mayport would retain the ability to berth a CVN in a limited fashion, as existing draft restrictions would remain in effect. The dredging project proposed under all Group 2 and 3 alternatives would not occur.

ES.4 PREFERRED ALTERNATIVE

This EIS analyzes 12 action alternatives and the No Action Alternative. Based on a thorough review of the alternatives, the Department of the Navy has determined Alternative 4 to be its Preferred Alternative. Alternative 4 involves homeporting one CVN, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities. Factors that influenced selection of Alternative 4 as the Preferred Alternative included impact analysis in the EIS, estimated costs of implementation, including military construction and other operation and sustainment costs, and strategic dispersal considerations. Homeporting a CVN at NAVSTA Mayport would enhance distribution of CVN homeport locations to reduce risks to fleet resources in the event of natural disaster, manmade calamity, or attack by foreign nations or terrorists. This includes risks to aircraft carriers, industrial support facilities, and the people that operate and maintain those crucial assets.

The aircraft carriers of the United States Navy are vital strategic assets that serve our national interests in both peace and war. The President calls upon them for their unique ability to provide both deterrence and combat support in times of crisis. Of the 11 aircraft carriers currently in service, five are assigned to the Atlantic Fleet. Utilizing the capacity at NAVSTA Mayport to homeport a CVN disperses critical Atlantic Fleet assets to reduce risks, thereby enhancing operational readiness. Operational readiness is fundamental to the Navy's mission and obligation to the Commander in Chief.

ES.5 PUBLIC INVOLVEMENT AND SCOPING

NEPA regulations require an early and open process for determining the scope of issues that should be addressed prior to implementation of a proposed action. The Navy initiated the public scoping process on 14 November 2006, by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register*, and sending copies of the NOI to federal, state, tribal, and local agencies, and other parties known or expected to be concerned about the proposed action.

A public scoping meeting was held on 5 December 2006, at the Florida Community College at Jacksonville South Campus. Comments from the public scoping meeting as well as written comments received in response to the published NOI were considered during development of the DEIS. A total of 17 comment packages were received including 82 comments.

The DEIS public review process provided the opportunity for stakeholders (including elected officials, government agencies, organizations, institutions, and individuals) to evaluate the DEIS and assist in determining whether it adequately addressed environmental issues of concern expressed during the scoping process. The DEIS public comment period began when the Notice of Availability of the DEIS was published in the *Federal Register* on 28 March 2008. In response to a request received during the comment period, the Navy extended the public comment period from a 45-day to a 60-day comment period, which ended on 27 May 2008. This extension was announced in the *Federal Register* on 2 May 2008. Throughout the DEIS public comment period, comments on the DEIS were received and compiled for consideration during preparation of the FEIS.

Notice of availability of the DEIS and an announcement of the public hearing was published in *The Florida Times Union* on 28 March 2008 (concurrent with the *Federal Register* notice), 13 April 2008 (the Sunday preceding the public hearing), and 16 April 2008 (the date of the public hearing). The public hearing on the DEIS was conducted on 16 April 2008 at the Florida Community College at Jacksonville - Deerwood Center, Old Baymeadows Road, Jacksonville, Florida. The public hearing was a combination of open house and formal public hearing formats.

The public hearing was attended by 100 persons (not including Navy personnel and contractors participating in or facilitating the public hearing meeting). A total of 34 persons submitted oral comments during the formal public hearing portion of the meeting. This included representatives for four federal elected officials, one local elected official, six local agencies or institutions, and six local organizations. Several of these commenters also provided written exhibits to add to their comments. No written comments were received at the public hearing. Written comments were received throughout the 60-day comment period by mail and through the public website (www.mayporthomeportingeis.com). During the DEIS public comment period, 120 elected officials, government agencies, organizations, institutions, or individuals provided comments.

The public website, www.mayporthomeportingeis.com, will remain available for public access for 60 days following the publication of the Navy's Record of Decision in the *Federal Register*. The FEIS will be available at the public website during the 30-day No-Action period that follows the publication of the Notice of Availability in the *Federal Register*. The Navy will sign the Record of Decision following conclusion of this 30-day No-Action period.

ES.6 SUMMARY OF ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Environmental impacts on the following resources are evaluated in this FEIS: earth resources, land and offshore use, water resources, air quality, noise, biological resources, cultural resources, traffic, socioeconomics, general services, utilities, and environmental health and safety. The environmental impact of implementing each alternative was evaluated against the 2006 baseline. Many impacts were common among Group 1, Group 2, and Group 3 alternatives. A detailed discussion of the environmental consequences for each resource area is provided in Chapter 4.

ES.6.1 Earth Resources

Alternatives 1, 5, 6, 7, 8, 11, and 12 would result in disturbance of 0.5-acre of soil and modification of topography associated with construction of the proposed headquarters facility. These minor impacts would be localized at the development site and minimized through adherence to best management practices and Florida Department of Environmental Protection (FDEP) Environmental Resource Permit conditions (which is required when total combined impervious surface associated with the proposed development is greater than 9,000 sf). There would be no impacts to marine sediments with implementation of any Group 1 alternative.

With the Group 2 and 3 alternatives, the dredging project would have physical effects on sediments and benthos (organisms that live on or in these sediments) at both the dredging site and ocean disposal site. Removal of sediment would have a long-term physical impact to the affected substrate that would be localized to the dredge sites. Impacts to sediment disposition rates were assessed under Section 6.3 (Water Resources) because the analysis was integrated with the assessment of other potential hydrological impacts. Smaller benthic organisms that would not flee during dredging may not survive dredging; however, re-colonization of the affected area by benthic organisms would occur over time at a rate dependent on various abiotic and biotic factors that would remain largely unchanged by the dredging activity. Offshore disposal of sediments would result in burial of some marine organisms, resulting in mortality to some. Overall, the impact would be localized to the ODMDS and temporary in nature. Disposal would be subject to Marine Protection, Research, and Sanctuaries Act Section 103 Evaluation, requiring verification by USACE and USEPA that the materials are suitable for ocean disposal.

Evaluations conducted in support of this FEIS determined that if all 5.2 million cy of dredged material from the proposed NAVSTA Mayport deepening project were disposed of at the Jacksonville ODMDS, the capacity of the Jacksonville ODMDS would be exceeded within a ten-year time period due to the estimated 4.6 million cy of material generated by maintenance projects over this timeline. Those impacts to the limited capacity of the Jacksonville ODMDS would be minimized by the Navy splitting the placement of the dredged material from the proposed deepening project such that approximately 2 million cy would be disposed of at the Jacksonville ODMDS and the remaining 3.2 million cy would be disposed of at the Fernandina ODMDS. This proportional split between the two ODMDSs is supported by the USEPA and USACE. Additional capacity analysis conducted by USACE at Jacksonville ODMDS concluded that the ODMDS could accommodate the Navy's proposed 2 million cy while still supporting other regional projected maintenance dredging projects for 8 to 10 years following the proposed Navy project.

Land-based construction for all Group 3 alternatives would result in the disturbance of approximately 30 to 32 acres of soils and modification of topography for construction of nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements at NAVSTA Mayport. Impacts would be minimized through erosion and pollution control procedures prescribed by the required Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems.

There would be no impact to earth resources under the No Action Alternative.

ES.6.2 Land and Offshore Use

Under Alternatives 1, 5, 6, 7, 8, 11, and 12, there would be localized impacts to NAVSTA Mayport land use from construction of the proposed headquarters facility in an existing vacant lot used intermittently as a contractor laydown area. All Group 3 alternatives would result in the construction of nuclear propulsion plant maintenance facilities, parking facilities, and transportation improvements at NAVSTA Mayport, which would result in the conversion of 15 acres of on-Station land designated as "logistics" to "maintenance," which would be compatible with existing land use. The widening of Massey Road (on NAVSTA Mayport) would lessen setbacks between the road and occupied structures, which will be fully evaluated in terms of antiterrorism/force protection requirements.

Under all Group 1 and Group 2 alternatives and Group 3 Alternatives 4 and 8, there would potentially be indirect off-Station impacts as a result of decreases in the NAVSTA Mayport population and corresponding reduced influence on commercial business, community housing, and recreation. With revitalization efforts in the area, there would likely be changes to the types of commercial and residential uses within their current distribution footprint. The magnitude of this potential impact would vary by alternative with Alternative 3 and the No Action Alternative would have the greatest decrease in population (decrease of approximately 3,900 net daily population), followed by Alternatives 1 and 7 (decrease of approximately 2,800 net daily population), then Alternative 5 (decrease of approximately 2,600 net daily population), then Alternatives 2 and 9 (decrease of approximately 2,300 net daily population), then Alternative 4 (decrease of approximately 1,600 net daily population), then Alternatives 6 and 11 (decrease of approximately 1,200 net daily population), and then Alternative 8 (decrease of approximately 430 net daily population).

There would be no foreseeable off-Station land use impacts under Group 3 Alternative 10, as the net daily population would be essentially the same as the baseline. With Group 3 Alternative 12, indirect impacts to off-Station land use would potentially result due to the increased population at NAVSTA Mayport. Impacts could include small-scale changes to commercial, industrial, and residential land uses in the area that, in concert with area revitalization efforts, could result in increased density of development and higher demand on recreation areas.

Under all Group 1 alternatives, there would be no impacts to commercial or recreational fisheries. The dredging proposed under the Group 2 and 3 alternatives would create localized, short-term impacts on commercial and sport fishing due to increased sedimentation levels during dredging activities. All alternatives would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the Florida Coastal Management Program (FCMP).

No impacts to land and offshore use are expected under the No Action Alternative.

ES.6.3 Water Resources

Under Alternatives 1, 5, 6, 7, 8, 11, and 12, the proposed development of the 0.5-acre headquarters facility construction site would result in increased impervious surface that would cause a slight decrease in infiltration of precipitation and result in localized impacts to stormwater flow. These minor impacts would be localized at the development site and minimized through adherence to best management practices and FDEP Environmental Resource Permit conditions (which is required if total combined impervious surface associated with the proposed development is greater than 9,000 sf). No new stormwater outfalls would be needed to support this proposed construction.

Under all Group 3 alternatives, there would be increased impervious surface and impacts to stormwater flow resulting from the 30-32 acres of development proposed for nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements. This minor decrease in infiltration of precipitation would be addressed in stormwater management, which would likely include detention or retention basins that would allow for recharge to the aquifer systems. The proposed construction does not include the addition of new stormwater outfalls, as these would not be needed to support the proposed construction. New impervious discharge considerations would be addressed in site design, and mitigation implemented to prevent additional nutrients from entering receiving waters. A construction site Stormwater Pollution Prevention Plan and Environmental Resource Permit would be required; NAVSTA Mayport's Multi-Sector Generic Permit Stormwater Pollution Prevention Plan would need to be modified to address new industrial activities and management; and NAVSTA Mayport's existing Municipal Separate Storm Sewer Systems permit plans and goals may need to be modified.

With implementation of any Group 2 or 3 alternative, dredging would not impact groundwater as the Floridan aquifer would not be breached and controls on upland disposal of dredged material (if it occurs) would be at existing, approved upland sites that hold FDEP permits that address controls to ensure no impact to groundwater. Hydrodynamic model results show that currents, salinity levels, and sedimentation rates in the NAVSTA Mayport turning basin, entrance channel, federal navigation channel, and the St. Johns River would not change significantly from existing conditions following the proposed dredging project. There would be short-term and localized impacts to surface water quality from suspended sediment due to proposed dredging. Following the cessation of dredging activities, evidence of suspended sediment would: (1) rapidly disappear within an hour and would totally disappear within four hours of clamshell dredge use within the NAVSTA Mayport turning basin, and (2) would totally disappear within one hour of hopper dredge use within the NAVSTA Mayport entrance channel and federal navigation channel. During the active dredging and disposal actions, a portion of the chemical burdens of sediment would be released into the water column.

For the DEIS, a single sample of surficial sediment and site water in the NAVSTA turning basin was collected for elutriate analysis (i.e., mixing sediment and site water and testing for the presence of contaminates in the dissolved state). Metals were detected in this sample of dredge elutriate. Most detected metals were below State Class III water quality standards, but arsenic levels were measured at 131 micrograms per liter (µg/l) (the Florida Class III water quality standard is 50 µg/l), mercury was measured at 30 µg/l (the Florida Class III water quality standard is 0.025 µg/l), and lead was measured at 26 µg/l (the Florida Class III water quality standard is 8.5 µg/l). Hydrodynamic model results indicate that the concentrations of mercury and lead sediment released in the water column during dredging would disperse within a short distance of the dredging action. Given the higher relative concentrations of arsenic, the dispersion would extend further, but at relatively low concentration (most of the dispersion would be at levels ranging 0.1 µg/l to 0.5 µg/l as compared to the 50 µg/l Class III water quality standard).

After publication of the DEIS (in summer 2008), additional elutriate testing of the sediment to be dredged was performed as part of the more intensive, site specific Marine Protection, Research, and Sanctuaries Act Section 103 Evaluation required for the permitting phase of the dredge project. Sediment samples were collected from the dredge project area (including at the same location as the sample taken for the DEIS analysis presented in the preceding paragraph) and analyzed for metals, polychlorinated biphenyls, pesticides, and polycyclic aromatic hydrocarbons. These parameters were found to be well below the Florida Class III surface water quality standards in all sediment samples within the dredge project area. These results suggest that the high levels of exceedance of Florida Class III surface water quality standards for arsenic, mercury, and lead in the sample collected for the DEIS analysis were an anomaly. These tests for mercury were performed using the required method detection limit of 0.2 µg/l. This detection limit is below the USEPA Federally recommended marine water quality criteria of 1.8 µg/l for acute exposure and 0.94 µg/l for chronic exposure, but above the Florida Class III marine water standard of 0.025 µg/l. Absent an allowable mixing zone, there is a potential for violation of the Florida Class III marine water quality standard for mercury at the dredging site. Due to the low levels involved, it is highly likely that any mercury present would disperse and be below the Florida Class III marine water quality standard within the allowed 150-meter mixing zone. To confirm this, a dilution model will be run during the permitting phase to determine the probable concentration of mercury at the boundary of the mixing zone assuming the initial value is one half the detection limit. Therefore, impacts to water quality from the dredge project included in the Group 2 and 3 alternatives would be minor and temporary.

A hydrodynamic model was used to estimate the changes in salinity and sedimentation deposition in the dredge project area. Changes in salinity predicted between the pre- and post-dredging condition within the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel were found to be within 0.5 percent. Model simulations showed that the maximum upstream extent of salinity intrusion in the St. Johns River would not change as a result of the proposed dredging. The modeling showed minimal changes in salinity resulting from dredging would occur near the mouth of the St. Johns River (generally, not beyond the Intracoastal Waterway). During a tidal cycle in a period of low river flow, salinity would increase less than 1 part per thousand at the surface and decrease less than 1 part per thousand at mid depth and the bottom as a result of the proposed dredging. During a period of high river flow, changes in salinity through the tidal cycle would increase by approximately 1-2 parts per thousand at the surface and decrease by approximately 1-2 parts per thousand at mid depth and the bottom as a result of dredging. Existing maximum bottom salinity levels range from approximately 35 parts per thousand at the mouth of the St. Johns River to 30 parts per thousand at roughly the Intracoastal Waterway. Annual sedimentation deposition volumes would increase by two percent within the NAVSTA Mayport turning basin, seven percent within the NAVSTA Mayport entrance channel, and two percent within the federal navigation channel.

Implementation of any Group 1 or 2 alternative would have no impact on wetlands or floodplains. Under all Group 3 alternatives, the outward fringes of the area of potential development for the nuclear propulsion maintenance facilities and portions of a road widening project are within the 100-year floodplain. However, impacts would be avoided by constructing facilities above the floodplain level. The proposed Massey Road/Bon Homme Richard Street intersection improvements are adjacent to a ditch that empties into a jurisdictional wetland. During the design phase, the improvements would be configured to avoid wetlands; if avoidance were not possible, impacts would be mitigated in accordance with Clean Water Act Section 404 requirements.

The No Action Alternative would have no impact on water quality.

ES.6.4 Air Quality

Under all action alternatives that include construction (all alternatives except for Alternatives 2, 3, and 9), there would be construction-related air emission increases. Group 1 alternatives would have minimal emissions. For Group 2 and 3 alternatives (which include construction dredging), there would be greater short-term increases in air emissions, primarily due to the dredging equipment and the tug engines used in transport of dredged materials to the ODMDSs. The greatest contribution would be in oxides of nitrogen (NO_x) emissions, with a maximum of approximately 199 tons estimated to occur in 2011 and 138 tons in 2012 under Group 3 alternatives. Duval County is designated as an attainment area under the Clean Air Act Amendments, and the General Conformity requirements or any other regulatory thresholds do not apply to this proposed action. The estimated 199 tons of NO_x emissions in 2011 is primarily due to emissions from mobile sources associated with the construction dredging. The estimated emissions would be a one-time occurrence and are not considered significant given the emissions represent only 0.26 percent of the total 2001 NO_x emissions in Duval County. The use of modern dredging equipment with USEPA rated tier 1, tier 2, or tier 3 diesel engines to the greatest extent practicable would help minimize NO_x emissions. Under the Group 3 alternatives, there also would be minor long-term increases in operational emissions associated with the boilers for new nuclear propulsion plant maintenance facilities and increased mobile source emissions from increased net daily population under Alternative 12, in particular. For Alternative 12, proactive practices to minimize the impact of increased mobile source emissions would be considered. In addition to encouraging car pooling, use of hybrid vehicles, use of mass transit by employees, and other alternative forms of transportation already in place (e.g., use of golf carts by ship repair contractors and several larger commands for routine transportation around the Station), NAVSTA Mayport would consider conversion of the current base shuttle service to Low Emission Vehicles during re-competition of that contract scheduled for 2009/2010 and replacement of NAVSTA Mayport's vehicle fleet with vehicles producing significantly fewer emissions than current models, wherever practicable.

The No Action Alternative would have no impact on air quality.

ES.6.5 Noise

Under Alternatives 1, 4, 5, 6, 7, 8, 10, 11, and 12, there would be a short-term minor increase in noise levels from land-based construction of the proposed headquarters facility in the vicinity of the NAVSTA Mayport Medical and Dental Clinic. Under all Group 2 and 3 alternatives, a short-term minor increase in noise levels related to dredging activities is expected to affect sensitive noise receptors within 2,000 ft of dredging activities. Sensitive noise receptors include the NAVSTA Mayport Pelican Roost recreational vehicle park and bachelor housing and the City of Jacksonville Huguenot Park. In addition, under all Group 3 alternatives, the Massey Road widening project would have short-term minor effects on on-Station sensitive noise receptors including the chapel and medical and dental clinic.

Alternatives 2, 3, and 9 and the No Action Alternative would have no noise impacts.

ES.6.6 Biological Resources

Under Alternatives 1, 5, 6, 7, 8, 11, and 12, the proposed headquarters facility would result in vegetation removal in landscaped and previously disturbed areas and temporary displacement of wildlife in suitable habitat within the 0.5-acre construction area (no sensitive vegetation or wildlife species occur at the site). In addition, under all Group 3 alternatives, construction of the nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements would have localized impacts to include vegetation removal in landscaped and previously disturbed areas and temporary displacement of wildlife in suitable habitat within the 30-32 acre construction areas (no sensitive vegetation or wildlife species occur at these sites).

Group 1 alternatives would have no impacts to marine communities, marine fish, Essential Fish Habitat (EFH), federally threatened or endangered species, or marine mammals.

Under all alternatives, there would be a decrease in annual Navy vessel transit activities for NAVSTA Mayport homeported ships (see ES.4.8), thereby reducing the long-term potential for NAVSTA Mayport homeported vessels to strike threatened and endangered species during these transits (primarily a concern with whales). Navy vessel transit activities are addressed in the Navy's 1997 Regional Biological Opinion (BO) with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast and the Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport under the East Coast Navy Tactical Training Theater Assessment Planning Program consultation.

With the proposed dredging under all Group 2 and 3 alternatives, there would be short-term minor impacts from dredging activities to marine resources, including marine flora, invertebrates, and fish in the vicinity of the dredging areas and ODMDS. The proposed dredge project is located within the vicinity of designated EFH for 21 Fishery Management Units (FMUs); none occur in the vicinity of the ODMDSs. Habitat Areas of Particular Concern designated for four of these FMUs (managed by the South Atlantic Fishery Management Council) occur within the vicinity of the proposed dredging activities. Dredging activities would be expected to result in fish temporarily avoiding the area; and the potential for entrainment of fish species at larval stages at levels which would not adversely impact EFH.

For all Group 2 and 3 alternatives, in accordance with section 7 of the Endangered Species Act (ESA), the Navy is in consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) regarding potential impacts to federally listed species and designated critical habitat. To support ESA consultation for this proposed action, the Navy and USACE, as a co-consulter, have prepared Biological Assessments (BAs) to assess the potential impacts of Group 2 and 3 alternatives on ESA-listed species and designated critical habitat. Agency coordination letters are provided in Appendix B.2. The BAs are provided in Appendix B.3. The Navy and USACE anticipate similar terms and conditions to those identified in existing relevant BOs for similar dredging activities to be identified in the NMFS BO for the proposed action. Navy and USACE dredging activities currently comply with such terms and conditions. The Letter of Concurrence will be obtained from the USFWS and the BO from NMFS prior to issuance of the Record of Decision for this FEIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision.

The focus of these ESA consultations is the dredge project as no threatened or endangered species would be affected by facility construction (proposed under all alternatives except for Alternatives 2, 3, and 9). With implementation of the expected conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO, the Navy and USACE have determined implementation of the dredge project included in all Group 2 and 3 alternatives would have no effect on nesting listed sea turtles, may affect, but is not likely to adversely affect North Atlantic right whales, humpback whales, or Florida manatee and would not destroy or adversely modify North Atlantic right whale or Florida manatee designated critical habitat. The Navy has found that with implementation of protective measures, the use of a mechanical and/or cutterhead dredge may affect, but is not likely to adversely affect listed sea turtles; the use of a hopper dredge may adversely affect listed sea turtles; and bed-leveling activities in association with dredging operations may affect, but are not likely to adversely affect sea turtles.

Potential impacts to marine mammals resulting from dredge activities associated with all Group 2 and 3 alternatives would be the same as those for special status species. The same protective measures (e.g., North Atlantic right whale Early Warning System and a 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision) would minimize impacts on all marine mammals. Although dolphins are sensitive to noise in some of the frequencies that would be generated from dredge activities, they are highly mobile and would only be anticipated in the vicinity of dredge operations for short periods of time. No injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed are expected.

Under all Group 3 alternatives, in-water construction activities associated with the installation of the Type III heavy weather moorings at Wharf F would require approximately one hour of pile driving that could result in additional impacts to marine mammals. However, mitigation is proposed to include use of a vibratory hammer for pile driving if at all practicable and ceasing operations when a marine mammal is observed within 50 ft of the proposed pile driving operations and until the animal leaves the area (this is an extension of this element of USACE's *Special Manatee Protection Conditions* to all marine mammals). Therefore, there would be no injury or mortality of any marine mammal species and no adverse affects on annual rates of recruitment or survival of any of the species and stocks assessed.

There would be no impact to biological resources under the No Action Alternative.

ES.6.7 Cultural Resources

Construction of a headquarters building under Alternatives 1, 5, 6, 7, 8, 11, and 12 would occur in previously disturbed areas of NAVSTA Mayport. No known historic properties would be affected either directly or indirectly under this group of alternatives. However, as an additional safeguard, the Navy would attach a post-review discovery clause to the contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery.

Group 2 and Group 3 alternatives all involve dredging. No known historic properties would be affected by dredging activities under this group of alternatives. Dredging in the federal navigation channel between the National Register of Historic Places (NRHP)-eligible jetties would occur within the existing dredged areas and would have no effect on the jetties. The Navy completed a remote sensing survey of the portions of the NAVSTA Mayport entrance channel and federal navigation channel to be dredged under the Group 2 alternatives that identified no survey targets having magnetic signatures suggestive of cultural resources within the proposed dredging prism. Two underwater survey targets suggestive of cultural resources were identified within 100 ft of the existing federal navigation channel (Appendix E.2). In October 2008, the Navy conducted an underwater intensive-level survey of these targets and determined that they were not eligible for inclusion in the NRHP (Appeendix E.3). Dredged material disposal in an USEPA-managed ODMDS would have no adverse effects as no known cultural resources are present at the ODMDS sites.

Under Group 3 alternatives, there is little potential to impact historic properties as a result of the construction of CVN propulsion plant maintenance facilities, wharf improvements, transportation improvements, and parking structures. All construction would occur in previously disturbed, built areas of the Station. No known historic properties are located within the areas of potential effects. As an additional safeguard, the Navy will attach a post-review discovery clause to the construction contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery. In addition, during the Massey Avenue/Maine Street intersection improvement construction, an archaeological monitor would be present to confirm that NRHP-eligible prehistoric archaeological site (8DU7458) is avoided.

The Navy has consulted with the Florida State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act to confirm that appropriate actions would be taken under each of the alternatives to ensure that historic properties would not be adversely affected in the course of this project undertaking. During the DEIS public comment period, the Navy received a letter of concurrence from the SHPO and a request for further consultation regarding 1) the underwater intensive-level survey and determination that the two targets evaluated are not eligible for inclusion in the NRHP and 2) in development of clause to attach to construction contracts addressing inadvertent discovery of cultural resources. The Navy subsequently consulted with the Florida SHPO (Appendix E.1) and expects full concurrence prior to issuance of the Record of Decision.

There would be no effect on cultural resources as a result of the No Action Alternative.

ES.6.8 Traffic

Under all alternatives that would involve construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative) there would be localized, short-term on-Station impacts to traffic from construction of new facilities (e.g., rerouting traffic and presence of construction vehicles). The Group 3 alternatives would have greater impacts on-Station, in that construction associated with the nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements are of larger scale and would result in rerouting of traffic for transportation improvement projects along Massey Avenue and temporary displacement of parking.

Under Group 3 Alternative 12, the net daily population is expected to increase by 9 percent resulting in 2,081 (approximately 2,100) additional vehicle trips per day. Increases in average annual daily traffic off-Station would range from 2.1 percent to 14.9 percent. Operating conditions on roadways and intersections under various traffic volume loads are described in terms of Level of Service (LOS). LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing free flowing operating conditions and LOS F representing heavy congestion and delay. Along roadway segments, LOS is based on the average daily traffic volume on a roadway and the volume-to-capacity ratio. Historical traffic data and subsequent 2014 projections from the Florida Department of Transportation Trends Program indicate that Alternative 12 would have minimal impact on LOS for the study area roadway segments. The traffic volume along a segment of Mayport Road near Atlantic Boulevard would be expected to decrease slightly from 2008 to 2014. However, LOS would continue to be deficient at LOS “E”. The LOS for the expressway segment of Wonderwood Drive (Girvin Road to State Route A1A) would degrade from LOS “A” to “B” from 2008 to 2014. However, this would be due primarily to projected increases in traffic in the area not related to implementation of Alternative 12. Projected traffic from Alternative 12 would have minimal impact on the roadway and would cause no change in LOS. Similarly, due to projected increases in area traffic, LOS for the arterial segment of Wonderwood Drive (State Route A1A to Mayport Road) would degrade from LOS “B” to “C” from 2008 to 2014. However, the projected traffic from Alternative 12 would have minimal impact on the roadway and would cause no change in LOS. All other roadway segments in the analysis would experience no changes to LOS.

Under all Group 2 and 3 alternatives, an estimated 2,000 to 6,000 barge trips (dependent on barge size) for the transport of dredged material to the ODMDS would temporarily increase marine vessel traffic over the 12 to 18-month duration of the dredging project, but would represent 2 to 5 percent of the approximately 81,000 annual vessel movements in the Jacksonville Harbor (and likely less based on the increasing trend of commercial vessel movements in the area). Over the long-term, the Navy vessel transit activities at NAVSTA Mayport (represented as from the Sea Buoy 7 miles offshore to the NAVSTA Mayport turning basin) associated with vessels homeported would be reduced commensurate with the decrease in homeported ships under all alternatives. For Group 3 Alternative 12, which would result in the greatest number of homeported ships in the 2014 end state (18 ships as compared to the 22 ships in the 2006 baseline), annual ship movements for homeported ships associated were estimated to be approximately 600. This represents a 9 percent reduction from the 2006 baseline.

No impacts to traffic would occur as a result of the No Action Alternative.

ES.6.9 Socioeconomics

The evaluation of socioeconomic impacts compares the 2006 baseline with the 2014 end state. Some socioeconomic impacts related to personnel levels at NAVSTA Mayport have already occurred due to personnel decreases associated with the decommissioning of the KENNEDY in 2007 and SERMC downsizing. As compared to the 2006 baseline, under all alternatives except for Alternatives 10 and 12, the NAVSTA Mayport population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rates by 2014.

Under Alternatives 1 and 7, the estimated construction impacts would total approximately $5 million and result in 53 jobs for Alternative 1 and would total approximately $85 million and 860 jobs for Alternative 7. For both alternatives, it is anticipated that the percent change for total dependents is -24 percent and total school age children is -23 percent. The average annual growth in direct jobs would be -3.8 percent and total change in employment would be approximately -3,500 jobs. Direct payroll would be reduced by $260 million and change in disposable income would be reduced by a total of approximately $246 million. Estimated local tax contributions would be reduced by approximately $11 million.

Under Alternative 2, there would be no construction impacts and, therefore, no new jobs. Under Alternative 9, construction impacts would total approximately $80 million and result in 810 jobs. For both alternatives the percent change for total dependents would be -20 percent and total school age children would be reduced by 19 percent. Average annual growth in direct jobs would be -3.2 percent and total change in employment would be approximately -2,900 jobs. Direct payroll would be reduced by $220 million and change in disposable income would be reduced by a total of $208 million. Estimated local tax contributions would be reduced by approximately $9 million.

Under Alternative 5, the estimated construction impacts would total approximately $7 million and result in 70 jobs. The percent change for total dependents would be -23 percent, and total school age children would be reduced by 21 percent. Average annual growth in direct jobs would be -3.5 percent, and total change in employment would be approximately -3,200 jobs. Direct payroll would be reduced by $242 million, and change in disposable income would be reduced by a total of $229 million. Estimated local tax contributions would be reduced by approximately $10 million.

Under Alternatives 6 and 11, the estimated construction impacts would total approximately $5 million and result in 53 jobs for Alternative 6 and would total approximately $85 million and 860 jobs for Alternative 11. For both alternatives, the percent change for total dependents would be -10 percent, and total school age children would be reduced by 9 percent. Average annual growth in direct jobs would be -1.5 percent, and total change in employment would be approximately -1,500 jobs. Direct payroll would be reduced by $110 million, and change in disposable income would be reduced by a total of $104 million. Estimated local tax contributions would be reduced by approximately $5 million.

Under Alternative 3, the estimated construction impacts would total approximately $80 million and result in 810 jobs. It is anticipated that the percent change for total dependents would be -35 percent, and total school age children would be reduced by 32 percent. Average annual growth in direct jobs would be -5.7 percent, and total change in employment would be approximately -4,900 jobs. Direct payroll would be reduced by $370 million, and change in disposable income would be reduced by a total of $350 million. Estimated local tax contributions would be reduced by approximately $16 million.

Under Alternative 4, the estimated construction impacts would total approximately $671 million and result in 7,400 jobs. It is anticipated that the percent change for total dependents would be -13 percent, and total school age children would be reduced by 12 percent. Average annual growth in direct jobs would be -2.1 percent, and total change in employment would be approximately -2,000 jobs. Direct payroll would be reduced by $150 million, and change in disposable income would be reduced by a total of $141 million. Estimated local tax contributions would be reduced by approximately $6 million.

Under Alternative 8, estimated construction impacts would total approximately $700 million and result in 7,700 jobs. It is anticipated that the percent change for total dependents would be -3 percent, and total school age children would be reduced by 3 percent. Average annual growth in direct jobs would be -0.5 percent, and total change in employment would be approximately -530 jobs. Direct payroll would be reduced by $40 million, and change in disposable income would be reduced by a total of $38 million. Estimated local tax contributions would be reduced by approximately $1 million.

Under Alternative 10, estimated construction impacts would total approximately $701 million and result in 7,700 jobs. It is anticipated that the percent change for total dependents would be 1 percent, and total school age children would increase by 1 percent. Average annual growth in direct jobs would be flat, and total change in employment would be 6 jobs. Direct payroll would increase by approximately $1 million, and change in disposable income would increase by $0.1 million. Estimated local tax contributions would increase by approximately $1 million. The NAVSTA Mayport population would essentially remain unchanged; therefore, on- and off-Station housing demand and occupancy rate would also remain unchanged.

Under Alternative 12, estimated construction impacts would total approximately $722 million and result in 7,900 jobs. It is anticipated that the percent change for total dependents would be 12 percent, and total school age children would be increased by 11 percent. Average annual growth in direct jobs would be 1.4 percent, and total change in employment would be approximately 1,500 jobs. Direct payroll would increase by $110 million, and change in disposable income would increase by a total of $104 million. Estimated local tax contributions would increase by approximately $6 million. The NAVSTA Mayport population would increase resulting in an overall increase in on- and off-Station housing demand and occupancy rate.

Under the No Action Alternative, the percent change for total dependents would be -35 percent and total school age children would decline by 32 percent as compared to the 2006 baseline. Average annual growth in direct jobs would be -5.7 percent and total change in employment would be a loss of approximately 4,900 jobs. Direct payroll would be reduced by $370 million, and change in disposable income would decline by a total of $349 million. Estimated local tax contributions would decrease by approximately $16 million. The NAVSTA Mayport population would decline, resulting in a decline in on- and off-Station housing demand and occupancy rate.

ES.6.10 General Services

As with the socioeconomic impact analysis, it should be noted that the evaluation of general services compare the 2006 baseline with the 2014 end state and that some impacts assessed herein have already occurred due to personnel decreases associated with the decommissioning of the KENNEDY and SERMC downsizing.

Under Alternative 10, the estimated gains of approximately 300 in dependent population, and 92 in school age children would be expected to result in a minor long-term increase in demand on fire and emergency services, recreational facilities and fields, family services, childcare services, and education at local schools. Under Alternative 12, there would be more marked impacts as a result of the estimated net gain of approximately 1,200 in net daily population, approximately 2,900 in dependent population, and approximately 890 in school age children. Under Alternative 12, gains in school age children could result in overcrowding of schools. Under Alternative 12, the Navy would provide assistance to the Duval County School District, to the extent practicable, in their pursuit of Federal Education Impact Aid to mitigate potential impacts to schools.

All other alternatives would result in declines in population and dependents and school age children associated with NAVSTA Mayport personnel. The greatest decreases would occur under Alternative 3 and the No Action Alternative (35 percent decrease in dependents and 32 percent decrease in school age children). Estimated decreases under other alternatives would range from a 3 percent to approximately 24 percent decrease. Population declines are not expected to affect most general services. With regard to schools, declines are expected to be somewhat offset by other shifts in demographics increasing enrollment in schools that NAVSTA Mayport dependents attend.

This FEIS provides Duval County School District with available, relevant demographic data that may be used in their enrollment projections used for facilities and redistricting planning.

ES.6.11 Utilities

Under Alternatives 1, 5, 6, 7, 8, 11, and 12, utilities for the proposed headquarters facility would be accommodated through hookups to the existing infrastructure. In addition, under the Group 3 alternatives, the area of potential development for nuclear propulsion maintenance facilities would require electrical, steam, compressed air, potable water, and stormwater upgrades to accommodate the demand. Increased impervious surface under all alternatives except for Alternatives 2, 3, and 9 would be addressed through adherence to applicable permit processes and requirements, including an FDEP Environmental Resource Permit, and the Navy’s Low Impact Development policy.

Under the No Action Alternative, there would be no impact to utilities.

ES.6.12 Environmental Health and Safety

Under all alternatives involving construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative), there would be short-term increases in hazardous/toxic materials use and waste disposal and an increase in related risks for hazardous/toxic materials release that would be managed in accordance with established procedures for proper management of these items. Construction-related safety risks would be managed in accordance with established safety procedures.

Under the Group 2 and 3 alternatives, the dredging project would result in increased fuel acquisition, temporary storage, and consumption. Dredging related safety risks would be managed in accordance with established safety procedures.

Under the Group 3 alternatives, quantities of various petroleum fuels in excess of current operating demand would be required to meet future operating demand due to the increase in the number of buildings and (under Alternative 12) increased net daily population at NAVSTA Mayport using fuels for heating, hot water production, and backup power supply. In newly constructed buildings, this increased demand for petroleum fuels would be mitigated through the implementation of sustainability strategies. Over the long term, the transportation improvement projects would increase vehicular and pedestrian safety along Massey Avenue and at the five intersections that would be improved.

Under all Group 3 alternatives, stringent Naval Nuclear Propulsion Program radiological control practices would be employed. The effectiveness of these stringent radiological control practices has been proven and documented.

Under all alternatives (including the No Action Alternative), there would not be disproportionately high and adverse human health or environmental effects on minority and/or low-income populations nor would there be environmental health risks and safety risks that may disproportionately affect children.

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CHAPTER 1
PURPOSE AND NEED FOR PROPOSED ACTION

The United States (U.S.) Department of the Navy (DoN or Navy) has prepared this Final Environmental Impact Statement (FEIS) in accordance with the National Environmental Policy Act (NEPA) of 1969; the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508); Chief of Naval Operations (CNO) Instruction 5090.1C *Environmental and Natural Resource Program Manual* (Navy Operating Instruction [OPNAVINST] 5090.1C).

The DoN is the lead agency for the proposed action. The U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) are serving as cooperating agencies, in accordance with 40 CFR 1501.6. See Chapter 11 List of Preparers for cooperating agency letters.

1.1 PROPOSED ACTION

The proposed action evaluated in this FEIS is to homeport additional fleet surface ships at Naval Station (NAVSTA) Mayport, Florida (Figures 1.1-1 and 1.1-2). This proposed action includes permanent assignment of surface ships and personnel. The Navy's FEIS reviews and assesses 12 action alternatives and the No Action Alternative:

- Cruiser/Destroyer (CRU/DES) homeporting (Alternative 1)
- Amphibious Assault Ship (LHD) homeporting (Alternative 2)
- Nuclear Powered Aircraft Carrier (CVN) capable (Alternative 3)
- CVN homeporting (Alternative 4)
- Amphibious Ready Group (ARG) homeporting (Alternative 5)
- Seven different combinations of the first four alternatives (Alternatives 6 – 12)
- No Action Alternative

The CVN homeporting and CVN capable alternatives differ. The CVN homeporting alternative would permanently assign the CVN and personnel to NAVSTA Mayport and provide adequate facilities to perform depot-level maintenance at that location. The CVN capable alternative does not involve the homeporting of a CVN, but would only provide adequate services, berthing, and access to a fully loaded CVN without draft restrictions for visits of up to 21 days at a time (depot-level maintenance facilities are not required if the CVN is not homeported). More detailed descriptions of each alternative are provided in Chapter 2.

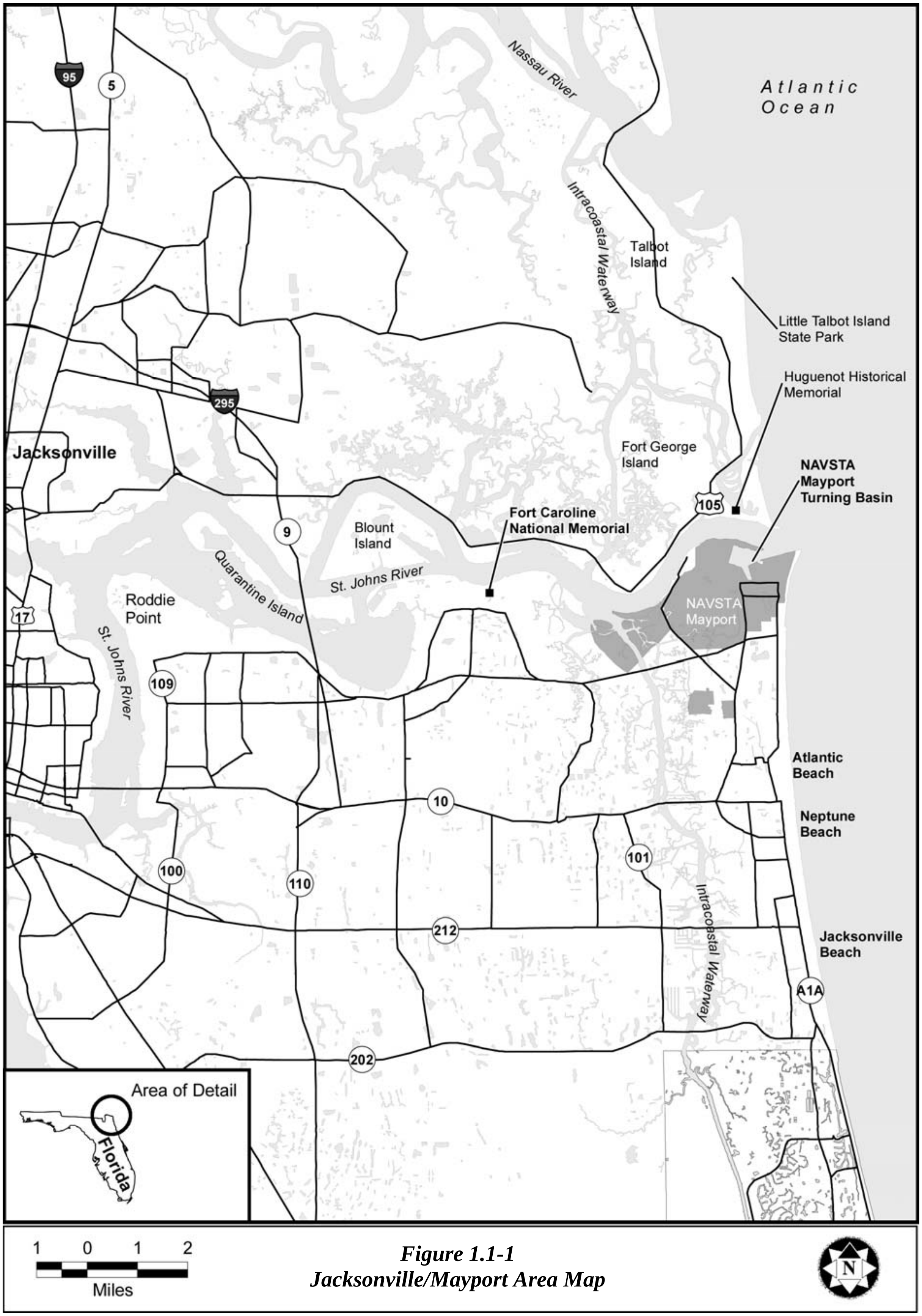


Figure 1.1-1
Jacksonville/Mayport Area Map

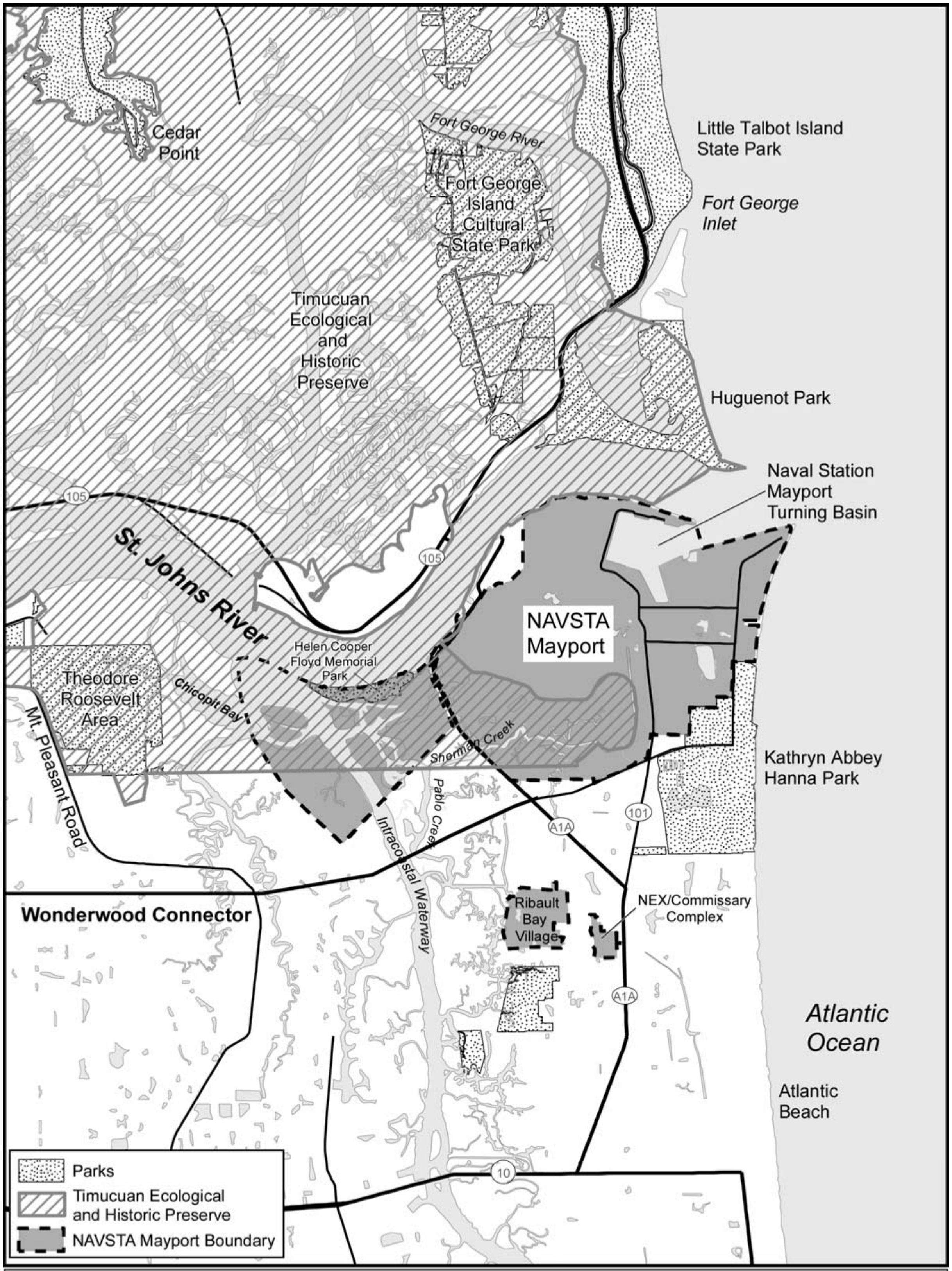


Figure 1.1-2
NAVSTA Mayport Vicinity

The proposed action could involve the relocation of existing ships to NAVSTA Mayport or assignment of newly acquired fleet ships to NAVSTA Mayport. The proposed action includes only required activities necessary to prepare and operate NAVSTA Mayport for the proposed homeporting and does not include actions at other Navy bases.

Depending on the alternative selected, the proposed action may include:

- Maintenance facilities improvements
- Utilities upgrades
- Personnel support improvements
- Wharf improvements (CVN homeporting alternatives only)
- Parking facilities and traffic improvements (CVN homeporting alternatives only)
- Construction of CVN nuclear propulsion plant maintenance facilities (CVN homeporting alternatives only)
- Dredging and disposal of dredged material (CVN homeporting and CVN capable alternatives)

Several alternatives could be implemented as early as 2009. Others would not be fully implemented until 2014, which would include meeting optimal berthing criteria developed by the fleet. As such, the end state year for the proposed action is 2014, which represents the earliest year all action alternatives could be fully implemented.

1.2 PURPOSE AND NEED

The purpose of the proposed action is to ensure effective support of fleet operational requirements through efficient use of waterfront and shoreside facilities at NAVSTA Mayport.

The 2001 Quadrennial Defense Review (QDR) called for the Department of Defense (DoD) to be capable of swiftly defeating aggression in overlapping conflicts worldwide. This required the Navy to modify its operational philosophy and to ensure it was capable of providing more warfighting assets, more quickly, to multiple locations. In Navy terms, this is called *surge capability* – or the ability to send trained naval battle forces *in addition to* those currently deployed. The Navy adopted the Fleet Response Plan (FRP) institutionalizing an enhanced naval surge capability.

Under the guidance of U.S. Fleet Forces Command (USFF), the fleet training cycle has been adjusted with refined maintenance, modernization, manning, and training processes to enable the fleet to consistently sustain a level of at least six surge capable carrier strike groups available within 30 days, and one additional strike group able to deploy within 90 days of an emergency order. Achieving this higher level of surge capability is a difficult task requiring Navy ships and Sailors to maintain an appropriate level of training (or *readiness*) for longer periods of time, while continuing to achieve ship maintenance and Sailor quality of life standards.

The Navy has developed plans for ashore infrastructure to ensure appropriate support of the FRP and the Navy's required operational battle force. While budgetary decisions drive the trend to consolidate or reduce the number of Navy bases overall, retaining bases in dispersed locations nationwide and worldwide supports the FRP and the operational battle force. Required capabilities at Navy bases are driven by strategic/geographic location and fleet operational readiness.

The USFF has finite berthing capacity for surface ships in the turning basin at NAVSTA Mayport. NAVSTA Mayport also has established shore support capacity for ship maintenance and repair, as well as military personnel support facilities, not being fully utilized. The Navy will begin in 2010 to decommission frigates currently homeported at NAVSTA Mayport. The Navy needs to utilize the available facilities at NAVSTA Mayport, both pierside and shoreside, in an effective and efficient manner, thereby minimizing new construction. The CNO has directed USFF to review and assess a broad range of options for homeporting additional surface ships at NAVSTA Mayport.

Consideration of NAVSTA Mayport as a homeport for any of the classes of ships being discussed in the FEIS is based on the following:

- Use of NAVSTA Mayport helps preserve distribution of homeport locations and ports to reduce the risks to fleet resources in the event of natural disaster, manmade calamity, or attack by foreign nations or terrorists;
- Full use of NAVSTA Mayport preserves the capabilities of the Jacksonville Fleet Concentration Area (FCA), which supports U.S. based naval surge capability; and
- Utilization of NAVSTA Mayport helps optimize fleet access to naval training ranges and operating areas by retaining ship homeport locations within six hours transit time of local operating areas.

1.3 NAVSTA MAYPORT

NAVSTA Mayport (also referred to as the station or installation throughout this document) is located in northern Florida (see Figure 1.1-1) east of Jacksonville along the St. Johns River and the Atlantic Ocean (see Figure 1.1-2). NAVSTA Mayport maintains and operates facilities which provide support to the operations of deploying Navy ships, aviation units, and staff; both home based and transient. NAVSTA Mayport also provides logistic support for operating forces, dependent activities, and other commands as assigned.

NAVSTA Mayport supports more than 60 commands, detachments, and private organizations and covers approximately 3,409 acres. NAVSTA Mayport has the third largest concentration of homeported fleet ships in the continental U.S. In 2006 NAVSTA Mayport was the homeport for 22 ships and homebase for six helicopter squadrons. The homeported ships included one conventional aircraft carrier (CV), 13 frigates (FFG), four cruisers (CG), and four destroyers (DDG), as shown below:

CV 67 USS JOHN F. KENNEDY	FFG 42 USS KLAKRING	CG 64 USS GETTYSBURG
FFG 8 USS MCINERNEY	FFG 45 USS DEWERT	CG 66 USS HUE CITY
FFG 28 USS BOONE	FFG 49 USS ROBERT G. BRADLEY	CG 69 USS VICKSBURG
FFG 29 USS STEPHEN W. GROVES	FFG 50 USS TAYLOR	DDG 64 USS CARNEY
FFG 32 USS JOHN L. HALL	FFG 56 USS SIMPSON	DDG 68 THE SULLIVANS
FFG 36 USS UNDERWOOD	FFG 58 USS SAMUEL B. ROBERTS	DDG 80 USS ROOSEVELT
FFG 39 USS DOYLE	CG 58 USS PHILIPPINE SEA	DDG 99 FARRAGUT
FFG 40 USS HALYBURTON		

While more than 16,000 personnel were assigned to NAVSTA Mayport in 2006 (DoN 2006a), the average daily population is estimated to be approximately 13,300 when considering deployment schedules, as summarized in Table 1.3-1, below.

Table 1.3-1 2006 Base Loading at NAVSTA Mayport

Nondeploying Population[1]	6,210
Ships Personnel in Port[2]	6,036
Air Squadrons[3]	1,026
Average Daily Population	**13,272**
Number of Ships Homeported[4]	**22**

Notes:
1. The nondeploying population are permanent party personnel that do not deploy to other locations for training and operations purposes.
2. Adjusted to account for the periodic deployment of active duty personnel assigned to ships homeported at NAVSTA Mayport. Ships' personnel are estimated to be in port 73 percent of the time (i.e., a 73 percent deployment factor).
3. Adjusted as described under note 2, but a 67 percent deployment factor is applied to air squadrons.
4. USS John F. Kennedy was decommissioned in 2007.

Source: Adapted from DoN 2006a

The baseline year, 2006, best represents recent operations at NAVSTA Mayport. 2006 was the final full year of operations of the conventional aircraft carrier USS JOHN F. KENNEDY (KENNEDY) prior to its decommissioning in 2007. While no fleet aircraft carriers are currently homeported at NAVSTA Mayport, it historically has served as an aircraft carrier homeport since 1955. NAVSTA Mayport was homeport to 37 ships in 1987, including two CVs. At that time, there were approximately 18,700 active duty personnel assigned to NAVSTA Mayport (DoN 1997). In the 1990s, the greatest number of ships were homeported in 1990 (35) and the fewest in 1993 (19). Between 1996 and 2006, the number of homeported ships fluctuated between 20 and 24 for an average of approximately 22 ships (Naval Historical Center 2007).

Operational commands located at NAVSTA Mayport include the following:

- Commander, U.S. Naval Forces Southern Command (COMUSNAVSO) is responsible for directing naval forces with partner nations within U.S. Southern Command (SOUTHCOM) Area of Responsibility (AOR) and is manned by 20 joint personnel (COMUSNAVSO 2007).
- Commander, U.S. Fourth Fleet (COMFOURTHFLT) is the numbered Fleet Commander assigned to COMUSNAVSO exercising operational control of assigned forces. COMFOURTHFLT conducts the full spectrum of Maritime Security Operations in support of U.S. objectives and security cooperation activities that promote coalition building and deter aggression. COMFOURTHFLT acts in concert with other SOUTHCOM components, coalition forces, and Joint Task Forces to promote peace, stability, and prosperity in the SOUTCHCOM area focus.
- Commander, Destroyer Squadron (DESRON) 14 is the Navy's largest destroyer squadron. As a regional support organization and training and readiness squadron, Commander, DESRON 14 responsibilities include acting as the Immediate Superior in Command (ISIC) of thirteen frigates (DESRON 14 2007; Burket 2007). In 2007, DESRON 14 became the Frigate class squadron (CLASSRON), a functional command organization responsible for the training, maintaining, manning, and logistics processes for all FFGs worldwide. The FFG CLASSRON was generated from existing waterfront and type commander (TYCOM) organizations and billets and supports ISICs and afloat Commanding Officers (Burket 2007).
- Commander, DESRON 24 is a tactical, deploying command staff consisting of three destroyers charged with commanding assigned ships for naval air and sea control missions. While in NAVSTA Mayport, Commander DESRON 24 staff supports the training and readiness needs of assigned ships, including support of Commander, Strike Force Training, Atlantic in training personnel to be deployed.
- Commander, DESRON 40 is a tactical, deploying command staff consisting of 22 active duty personnel supported by two reserve units. DESRON 40 is assigned to COMUSNAVSO and deploys primarily to the SOUTHCOM AOR executing operations, exercises and Theater Security Cooperation (TSC) country engagement activities. As a tactical DESRON administratively

assigned to SOUTHCOM, DESRON 40 does not have ships permanently attached but embarks ships as required to conduct operations and exercises.

- Commander, Helicopter Maritime Strike Wing, USFF, consists of one Fleet Replacement Squadron (FRS), four operational sea-duty squadrons, and one fleet reserve squadron. The FRS is responsible for the initial training of pilots, aircrewmen, and helicopter maintenance technicians for deployment with the fleet squadrons. Fleet squadrons prepare detachments for deployment in Light Airborne Multi-Purpose System (LAMPS) configured ships of the fleet (FFGs, DDGs, and CGs), and operate the SH-60B Seahawk helicopter in the principal mission areas of anti-surface and anti-submarine warfare (Commander, Helicopter Maritime Strike Wing, U.S. Fleet Forces 2007).

NAVSTA Mayport is also home to several major tenants that support the fleet as part of the Jacksonville FCA. They include:

- Southeast Regional Maintenance Center (SERMC) houses a 175,000-square foot (sf) industrial facility manned by military and civilian personnel working in more than 60 shops and work centers (Agnor 2006). Overall, SERMC provides inspection services, maintenance, and repair support to fleet ships throughout the southeast; trains shipboard personnel in the areas of supply, damage control, and weapons handling; coordinates diving operations and radar emission control; administers shipbuilding design, conversion, and facility contracts at private shipyards; and plans and procures parts and equipment for ships undergoing overhauls. SERMC administers contracts to shipyards based on ship maintenance and repair workloads. In 2006, SERMC consisted of approximately 1,504 personnel, including 909 military or civilian personnel and the equivalent of 595 contract personnel. SERMC is expected to reduce military and civilian personnel loading from approximately 909 to 280 by August 2008. This reduction is primarily in military personnel. During the same time, contractor support is also projected to increase from 217,000 contractor mandays in 2006 to approximately 250,000 contractor mandays in 2008, or approximately the equivalent of 90 additional full time contractor personnel (Agnor 2006, Agnor 2007). This equates to an overall reduction from 1,504 SERMC personnel in 2006 to 965 personnel in 2008.
- Afloat Training Group (ATG) Mayport provides afloat training to Navy and Coast Guard Sailors to ensure a combat-ready force. ATG Mayport supports Commanding Officers and ISICs in training ship's training teams to establish and maintain required operational capabilities, including damage control, combat systems, navigation, seamanship, aviation and medical. When

necessary, ATG teams travel out of homeport to support scheduled training and emergent training requests. Approximately 300 military personnel currently staff ATG Mayport.

- NAVSTA Mayport's Harbor Operations department oversees operations of NAVSTA Mayport's seaport. The department supports ships' berthing requirements and provides fire-fighting support, search and rescue assistance, spill cleanup response, salvage assistance, Harpoon maintenance, 2,500-ton ammunition handling, emergency personnel transfers at sea, and degaussing range services. More than 100 military members and 16 civilian employees provide fleet support, serving as ships' pilots, tug captains, riggers, mechanics, electronic technicians, and welders.

NAVSTA Mayport ship berthing facilities are provided at 16 berthing locations along wharves A through F located around the turning basin perimeter (Figure 1.3-1). (NAVSTA Mayport has the capacity to homeport more than 16 ships due to the ability to nest more than one ship at many of the berths and due to ship deployment schedules that result in only 73 percent of each ship type being in port at any one time). The turning basin is approximately 2,000 by 3,000 feet (ft) in size and is connected to the St. Johns River by a 500-ft wide entrance channel. There is 8,284 linear ft of general purpose berthing space at NAVSTA Mayport (Commander Navy Region Southeast [CNRSE] 2006). Select specifications for the wharves, tug basin, and “slot” (area between C-1 and C-2) are provided in Table 1.3-2.

Wharf C-1 is used as NAVSTA Mayport’s primary weapons handling berth. Wharves E and F are configured to support maintenance requirements of the ships at NAVSTA Mayport. On average, five ships are undergoing minor repairs and three to four ships are undergoing major repairs (i.e., the Selected Restricted Availability [SRA] maintenance period) (Reeder 2006). SERMC and existing shipyards at NAVSTA Mayport (Earl Industries, LLC; North Florida Shipyards, Inc.; and Atlantic Marine, Inc.) are all located east of Wharves E and F.

There currently are no dry dock facilities located at NAVSTA Mayport. The Secretary of the Navy conveyed the medium auxiliary floating dry dock SUSTAIN (AFDM7) to Atlantic Marine Property Holding Company. This dry dock is located at Atlantic Marine’s facilities on the north side of the St. Johns River west of NAVSTA Mayport. Maintenance and berthing services for ships (up to the size of a cruiser) homeported at NAVSTA Mayport are provided at this dry dock, which has a lifting capability of 14,600 tons and can accommodate vessels up to 620 ft (Atlantic Dry Dock Corp 2006).

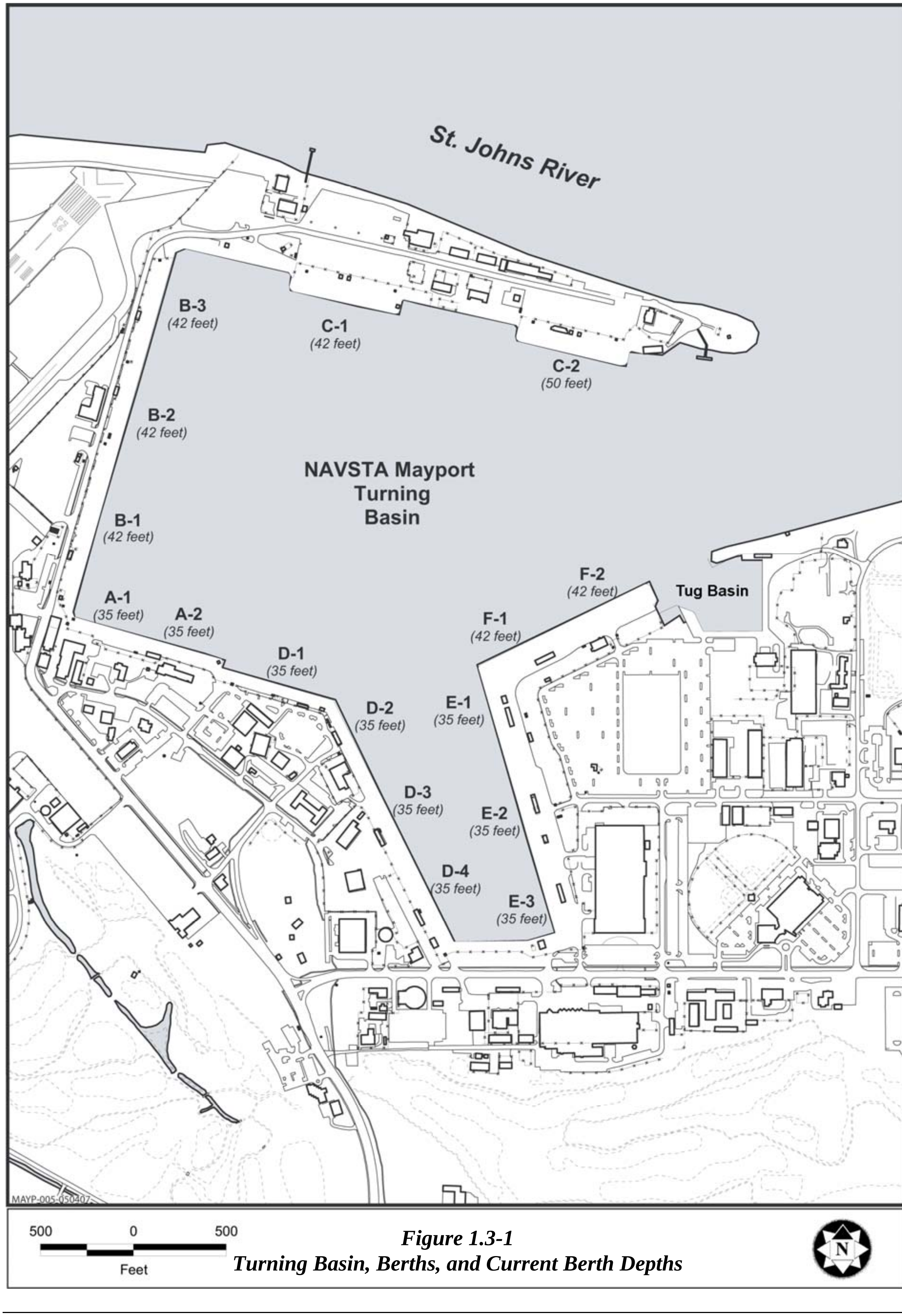


Figure 1.3-1
Turning Basin, Berths, and Current Berth Depths

Table 1.3-2 NAVSTA Mayport Existing Berth Specifications

Wharf	Type	Length (ft)	Width (ft)	Water Depth (ft)	Type of Ships Berthed (primary class in boldface)
A-1	General Purpose - Small	225	70	35	MCM
A-2	General Purpose - Medium	570	70	35	**CG**/DDG/FFG
B-1	General Purpose - Medium	650	100	42	**CG**/DDG/FFG
B-2	General Purpose - Medium	650	100	42	**CG**/DDG/FFG
B-3	General Purpose - Medium	650	100	42	**CG**/DDG/FFG
C-1	General Purpose - Large	608	125	42	**CV**/CG/DDG
C-2	General Purpose - Large	608	125	50	**CV**/CG/DDG
D-1	General Purpose - Medium	575	60	35	**CG**/DDG/FFG
D-2	General Purpose - Medium	450	60	35	CG/DDG/**FFG**
D-3	General Purpose - Medium	450	60	35	CG/DDG/**FFG**
D-4	General Purpose - Medium	450	60	35	CG/DDG/**FFG**
E-1	General Purpose - Medium	466	75	35	**CG**/DDG/FFG
E-2	General Purpose - Medium	466	75	35	CG/DDG/**FFG**
E-3	General Purpose - Medium	466	75	35	CG/DDG/**FFG**
F-1	General Purpose - Medium	500	105	42	**CG**/DDG/FFG/CV
F-2	General Purpose - Medium	500	105	42	**CG**/DDG/FFG/CV
Tug Basin	Small Craft	580		35	Tugs
Slot	Small Craft	650		35	YD/YC/LCM

Source: Adapted from Naval Facilities Engineering Service Center 2002

MCM = Mine Countermeasures
CV = Aircraft Carrier (conventional)
CG = Cruiser
DDG = Destroyer
FFG = Frigate
YD = Floating Crane
YC = Open Lighter
LCM = Mechanized Landing Craft

1.4 PUBLIC INVOLVEMENT

1.4.1 Scoping Process

NEPA regulations require an early and open process for determining the scope of issues that should be addressed prior to implementation of a proposed action. The Navy initiated the public scoping process on 14 November 2006, by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register* (DoN 2006b), and sending copies of the NOI to federal, state, tribal, and local agencies, and other parties known or expected to be concerned about the proposed action. In addition, the Navy published information regarding the public scoping meeting in *The Florida Times Union* on 14 November (concurrent with the *Federal Register* notice), 29 November (one week prior to the scoping meeting), and 3 December (the Sunday preceding the scoping meeting). Appendix J provides more public participation information. A public scoping meeting was held on 5 December 2006, at the Florida Community College at Jacksonville South Campus. Thirty-eight people attended the scoping meeting and three comment sheets were collected at that time.

Additional comments were collected during a 45-day public scoping period. A total of 17 comment packages including 82 written comments were received in response to the published NOI, scoping meetings, and agency letters that were considered during development of the Draft EIS (DEIS).

The issues raised during the public scoping period are categorized by issue and summarized below in Table 1.4-1. See Appendix J for specific comments.

Table 1.4-1 Issues Identified During Public Scoping

Topic	Issue identified in Comment
Purpose and Need	• Discussion of vital nature of NAVSTA Mayport • Discussion of fleet dispersal • Inclusion of history of aircraft carriers at NAVSTA Mayport • Discussion of the 2005 Base Realignment and Closure (BRAC) and 2006 QDR processes and recommendations as they pertain to NAVSTA Mayport
Alternatives	• Clear description of dredging methods • Consideration of alternative ocean disposal sites for dredged material • Description of Navy's ability to conduct routine ship homeporting • Description of improvements needed to support each alternative • Additional alternatives for ARG combinations and Littoral Combat Ship homeporting • Identification of possible sources (i.e., current homeports) of ships to be reassigned to NAVSTA Mayport and evaluation of direct, indirect, and cumulative environmental impacts to those ports, including cost-benefit analysis of existing homeport infrastructure versus new infrastructure at NAVSTA Mayport
Earth Resources	• Accuracy (depth) of bucket dredge methodology • Need for accurate hydrographic surveys • Accurate characterization of dredge material, including biological testing • Impacts of dredging on sand deposition in Fort George River Inlet
Land Use	• Impacts on recreational uses • Consistency with Florida Coastal Zone Program • Impacts of ship ordnance handling operations at NAVSTA Mayport or Marine Corps Support Facility Blount Island on NAVSTA Mayport port operations
Water Resources	• Impacts on groundwater aquifers, recharge zones, and water supplies from dredging operations, including blasting and drilling of limestone • Impacts of dredging and disposal of contaminated sediments on water quality • Impacts of dredging on salinity levels in St. Johns River • Compliance with Florida Department of Environmental Protection regulatory requirements
Air Quality	• Impacts on air quality from construction and operations
Noise	• No comments received regarding noise
Biological Resources	• Impacts on sea turtles and other marine species

Table 1.4-1 Issues Identified During Public Scoping

Topic	Issue identified in Comment
	• Impacts on threatened and endangered species in vicinity • Impacts of dredging operations and dredge material disposal on right whales, manatee, and critical habitat • Impacts on Timucuan Ecological and Historical Preserve wetlands, salt marsh habitat, and estuarine health
Cultural Resources	• Impacts on historical and cultural resources on land and in water
Traffic	• Impacts on traffic
Socioeconomics	• Cost associated with CVN homeporting • Impacts on local large deck ship technical expertise and ship maintenance capacity • Impacts on ship repair service industry • Impacts on economy at local and regional levels • Impacts of increased population associated with homeporting alternatives
General Services	• Impacts on state and local government to provide infrastructure (roads, sewer, water), educational facilities, courts
Utilities	• Impacts on stormwater and waste water capacity
Environmental Health and Safety	• Identification of contamination issues associated with facility construction/expansion • Hazardous waste/hazardous materials operations and disposal • Impacts of required demolition program
Radiological Aspects of Nimitz Class Aircraft Carrier Homeporting	• Impacts of radiological aspects of the CVN propulsion system

1.4.2 DEIS Public Comment Process

The DEIS public review process provides the opportunity for stakeholders (including government agencies, special interest groups, and private citizens) to evaluate the DEIS and assist in determining whether it adequately addresses environmental issues of concern expressed during the scoping process. The DEIS public comment period began when the Notice of Availability was published in the *Federal Register* on 28 March 2008 (USEPA 2008c). A notice of the public hearings also was published in the *Federal Register* on 28 March 2008 (DoN 2008a). In response to comments received during the comment period, the Navy extended the public comment period from a 45-day to a 60-day comment period, which ended on 27 May. This extension was announced in the *Federal Register* on 2 May 2008 (DoN 2008b). Throughout the DEIS public comment period, comments on the DEIS were received and compiled for consideration during the preparation of the FEIS.

Notice of the availability of the DEIS and an announcement of the public hearing was published in *The Florida Times Union* on 28 March (concurrent with the *Federal Register* notice), 13 April 2008 (the Sunday preceding the public hearing), and 16 April 2008 (the date of the public hearing).

A list of federal, state, and local elected officials, agencies, and organizations, as well as individuals who received the DEIS (bound or CD-ROM) is provided in Appendix J. The DEIS also was sent to the following library repositories:

- Beaches Library, 600 3rd Street, Neptune Beach, Florida (FL) 32266
- Pablo Creek Library, 13295 Beach Blvd., Jacksonville, FL 32246
- Regency Square Library, 9900 Regency Square Blvd., Jacksonville, FL 32225
- Main Library, 303 N. Laura Street, Jacksonville, FL 32202
- Public Library, 25 N. 4th Street, Fernandina Beach, FL 32034

An electronic version of the document was posted on the public access project website (http://www.mayporthomeportingeis.com).

The public was provided opportunities to submit written comments by mailing them to the Navy, typing them into project website, or submitting a comment card at the public hearing. Oral comments were recorded during the formal portion of the public hearing. The Navy initiated news releases heard on local radio stations in the Mayport area and hosted a media availability event prior to the public hearing to facilitate, radio, newspaper, and television coverage of the public participation process.

A public hearing on the DEIS was conducted on 16 April 2008 at the Florida Community College at Jacksonville - Deerwood Center, Room B1204, 9911 Old Baymeadows Road, Jacksonville, Florida. The public hearing was a combination of open house and formal public hearing formats. The open house portion of the meeting was held from 4:30 to 6:30 p.m. and the public hearing occurred from 6:30 to 8:30 p.m. This meeting style provided interested persons an opportunity to review information, ask questions about the Navy's proposed action and alternatives, and voice their specific concerns to project representatives prior to the formal public hearing. The open house layout provided attendees with a continuous and logical flow of information on the project and offered various ways to make comments. All attendees were encouraged to sign in for the attendance record. Those wishing to provide oral comments were asked to indicate such in advance of the formal public hearing portion of the meeting.

The public hearing portion of the meeting included a brief presentation summarizing the proposed action and alternatives and key DEIS findings followed by the verbal comment period.

The public hearing meeting was attended by 100 persons (not including Navy personnel and contractors participating in or facilitating the public hearing meeting). This included 11 members of the media. Most of the public hearing attendees were from the Jacksonville, Florida area, but attendees with addresses of Tallahassee, Florida; Charleston, South Carolina; Arlington, Virginia; and Norfolk, Virginia also attended.

A total of 34 persons submitted oral comments during the formal public hearing portion of the meeting. This included representatives for four federal elected officials, one local elected official, six local agencies or institutions, and six local organizations. Several of these commenters also provided written exhibits to add to their comments. No other written comments were received at the public hearing.

1.4.3 DEIS Comments

In addition to the comments received at the public hearing, the Navy received comments on the DEIS via postal mail and e-mail via the project website. As summarized in Table 1.4-2, there were a total of 120 persons, agencies, or organizations that commented on the DEIS. Some of these commenters used several means to submit comments (e.g., oral comment during the public hearing, postal, and/or e-mail comment) or submitted more than one comment during the comment period, but most just submitted comments once using one method for submitting comments.

Table 1.4-2 Summary of DEIS Commenters

Commenter Category	**Number of Commenters**
Elected Officials	
Federal	5
State	1
Local	4
Agencies and Institutions	
Federal	5
State	2
Local	10
Organizations	13
Individuals	80
Total	**120**

Table 1.4-3 presents a categorization of the comments received during the DEIS public review process. The majority of comments were statements of preference on an alternative or group of alternatives for the ships to be homeported at NAVSTA Mayport. Appendix L of this FEIS includes copies of all formal

Table 1.4-3 Summary of DEIS Public Comment Topics

Comment Category	Comment Topic	Number of Commenters Addressing Topic[1]
Overarching	Scope of EIS too narrow	4
	Importance of fleet dispersal	33
	Used incorrect baseline year	1
	Role of environmental permitting during implementation	3
Alternatives and Project Description	Statements of preference for alternative or ships to be homeported	71
	Justify/reconsider proposed dredge depth of -54 feet	2
	Frequency of maintenance dredging	2
	Upland disposal sites	2
	Personnel estimates	1
	Construction details/comparison between alternatives	1
Earth Resources	Impact on ocean dredged material disposal site (ODMDS) capacity	3
	Mercury level in elutriate analysis sample	1
Land and Offshore Use	Cumulative impacts of proposed new cruise terminal at Mayport	1
	Coastal consistency (receipt of concurrence from Florida Department of Environmental Protection)	1
Water Resources	Changes in salinity	4
	Stormwater controls	2
Air Quality	Ships emissions	1
	Mobile emissions	1
	Indoor air quality and Hazardous Air Pollutants	1
Noise	Aircraft noise	2
Biological Resources	Endangered Species Act consultation	3
	Concern about impacts	1
	North Atlantic right whale and critical habitat concerns	1
	Essential Fish Habitat	1
	Cumulative impacts	1
Cultural Resources	Receipt of concurrence from State Historic Preservation Officer	1
Traffic	Mass transit	1
	Impacts of Group 3 alternatives	1
	Inadequate analysis	1
	Alternative transportation	1
Socioeconomics	Costs for alternatives (clarification)	1
	Sailor housing	1
	Cumulative impacts on housing	1
General Services	Clarifications on impacts to schools	7
Utilities	Energy demand associated with CVN	1
Environmental Health and Safety	Alleged health and safety violations at NAVSTA Mayport	1
Radiological Aspects of CVN Homeporting	Proximity of nuclear reactors to homes	2
	Emergency procedures	2
	Nuclear repair capability at Naval Submarine Base Kings Bay	2
Administrative	Request for EIS documents/notification	14
	Request for extension of DEIS comment period	3
Editorial	Typographical errors, etc.	2
Other	Inadequate analysis of No Action Alternative, indirect impacts, cumulative impacts, and issues raised during scoping	1

[1] This column denotes the number of commenters addressing the topic. A single commenter may have addressed more than one topic.

comments received on the DEIS during the 60-day public review period notating responses to comments, including where the document was modified, if appropriate.

1.4.4 Public Review of the FEIS

The public website (www.mayporthomeportingeis.com) will remain available for public access for 60 days following the publication of the Navy's Record of Decision in the *Federal Register*. The FEIS will be available at the public website during the 30-day No Action period that follows the publication of the Notice of Availability in the *Federal Register.* The Navy will sign the Record of Decision following the conclusion of this 30-day No Action period.

1.5 MAJOR DIFFERENCES BETWEEN THE DEIS AND FEIS

Several of the comments received by the Navy during the DEIS review period led to revisions to the body of the DEIS in order to complete the FEIS. Revisions to the text included minor clarifications and inclusion of updated and additional information. No major changes to the document content were warranted or conducted as a result of public comment and review. None of the changes made to the text are believed to have any profound effect on the findings and conclusions that were presented in the DEIS. The most significant modifications were to:

- Section 2.3.1.1, Section 2.3.1.2, and Table 2.3-1 to eliminate the -2 ft of advanced maintenance from those areas of the dredge project determined to have lower shoaling rates in modeling completed subsequent to the publication of the DEIS. This reduced the estimated quantity of material to be dredged in support of Group 2 and 3 alternatives by approximately 10 percent (from 5.7 million cubic yards [cy] to 5.2 million cy). Associated changes to the impact analyses were made throughout Chapter 4, particularly Section 4.3.

- Section 2.3.1.2 to conclude based on additional dredge sediment sampling conducted subsequent to publication of the DEIS that beneficial use of dredge material for beach nourishment would not occur. Associated changes were made throughout Chapter 4. As a result of this conclusion, consultation with the U.S. Fish and Wildlife Service (USFWS) largely focuses on potential impacts to the federally listed endangered Florida Manatee.

- Sections 2.3 and 2.4 to update the schedule for improvements to implement Group 2 and 3 alternatives, respectively, for CVN capability from as early as 2011 to as early as 2012; and CVN homeporting from as early as 2012 to as early as 2014. These date changes reflect the Navy's normal military construction program timelines that are dependent upon the selection of a Preferred Alternative and signature of the Record of Decision prior to implementation of the proposed action. As a result of these date changes the numbers of personnel assigned to NAVSTA Mayport under the alternatives involving homeporting of a CVN (Group 3 alternatives) were recalculated to reflect the influx of personnel in 2014 rather than 2012 as identified in the DEIS. Associated changes to the impact analyses were made throughout Chapter 4.

- Section 2.8 to identify the Preferred Alternative selected by the Navy subsequent to the publication of the DEIS.

- Sections 3.6.1.3 and 4.6 to more thoroughly describe and assess Essential Fish Habitat (EFH) and Habitat Areas of Particular Concern (HAPC) managed by relevant fisheries management councils and the National Marine Fisheries Service (NMFS).

- Section 4.9 to update estimated expenditures associated with military construction projects pertaining to each alternative. These were refined by the Navy subsequent to the publication of the DEIS.

- Section 4.6 and Appendix B.3 to include the Biological Assessments (BAs) prepared for the USFWS and NMFS.

CHAPTER 2
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action and potential alternatives to implement the proposed action, i.e., homeporting additional surface ships at NAVSTA Mayport. Each of the 12 action alternatives are described below and are evaluated against the purpose and need. All alternatives satisfying the purpose and need will be evaluated in detail in this EIS, along with the No Action Alternative. A full discussion of each alternative's ability to meet the purpose and need occurs in Section 2.6.

The CNO identified homporting options in Alternatives 1 through 5, and directed USFF to review and assess a broad range of options for homeporting additional surface ships at NAVSTA Mayport (resulting in Alternatives 6-12). Alternatives 6 through 12 consider combinations of individual homeporting options from Alternatives 1 through 4. The types of ships addressed in the EIS include those currently homeported at NAVSTA Mayport: CGs, DDGs, and FFGs, as well as additional types of ships identified by CNO, including amphibious assault ships (LHDs), amphibious transport dock ships (LPDs), dock landing ships (LSDs), and a nuclear powered aircraft carrier (CVN). The type and number of ships proposed in each alternative were either specified by CNO or defined by fleet TYCOMs. The number of additional ships proposed for each alternative is in addition to the ships currently homeported at NAVSTA Mayport. The alternatives considered in this EIS could be implemented between the years of 2009 and 2014, depending upon deployment schedules of ships or construction schedules for facilities associated with each alternative. As such, the year 2014 represents the end state, or the year by which all alternatives could be fully implemented.

The following is a brief description of 12 action alternatives and the No Action Alternative:

1. <u>CRU/DES homeporting</u> involves homeporting of five additional ships. The term "CRU/DES" is the Navy's designation for large surface combatants that may include cruisers, destroyers, or frigates. For this alternative, the additional ships would include four DDGs and one FFG, as well as additional DESRON staff.

2. <u>LHD homeporting</u> involves homeporting of two additional LHDs.

3. <u>CVN capable</u> involves a dredging project to allow access and berthing without draft restrictions of one CVN. No CVN would be homeported at NAVSTA Mayport under this alternative.

4. <u>CVN homeporting</u> involves homeporting of one CVN, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities.

5. ARG homeporting involves homeporting of three additional ships (one LHD, one LPD, and one LSD) and amphibious squadron (PHIBRON) staff.

6. CRU/DES homeporting and LHD homeporting involves homeporting of seven additional ships, including four DDGs, one FFG, and two LHDs, as well as additional DESRON staff.

7. CRU/DES homeporting and CVN capable involves homeporting of five additional ships, including four DDGs and one FFG, and additional DESRON staff, as well as a dredging project to allow access and berthing without draft restrictions of one CVN. No CVN would be homeported at NAVSTA Mayport under this alternative.

8. CRU/DES homeporting and CVN homeporting involves homeporting of six additional ships, including four DDGs, one FFG, and one CVN, additional DESRON staff, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities.

9. LHD homeporting and CVN capable involves homeporting of two additional ships, both LHDs, as well as a dredging project to allow access and berthing without draft restrictions of one CVN. No CVN would be homeported at NAVSTA Mayport under this alternative.

10. LHD homeporting and CVN homeporting involves homeporting of three additional ships, including two LHDs and one CVN, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities.

11. CRU/DES homeporting and LHD homeporting and CVN capable involves homeporting of seven additional ships, including four DDGs, one FFG, and two LHDs, additional DESRON staff, as well as a dredging project to allow access and berthing without draft restrictions of one CVN. No CVN would be homeported at NAVSTA Mayport under this alternative.

12. CRU/DES homeporting and LHD homeporting and CVN homeporting involves homeporting of eight additional ships, including four DDGs, one FFG, two LHDs, and one CVN, additional DESRON staff, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities.

13. The No Action Alternative would result in homeporting no additional ships at NAVSTA Mayport. NAVSTA Mayport would retain the ability to berth a CVN in a limited fashion;

existing draft restrictions would remain in effect. The dredging project associated with the CVN capable and CVN homeporting alternatives would not occur.

For the convenience of the reviewer, a glossary of terms used in this FEIS can be found in Appendix K.

2.1 GROUPING OF ALTERNATIVES

The 12 action alternatives include a wide range of scenarios for ship classes and combinations of classes. To discuss all 12 alternatives and the impacts individually would be a lengthy and repetitive process. The alternatives have therefore been separated into three groups based on fundamental components common to all the alternatives in each group. The alternatives in each group are addressed collectively, particularly in the environmental consequences section of this EIS. Table 2.1-1 below summarizes the additional ships and personnel proposed for each alternative.

- **Group 1 – Alternatives Involving Homeporting of Surface Ships (Non-CVN)**. These alternatives involve only homeporting of surface ships and require no dredging and minimal construction activities. The four alternatives in Group 1 include:
    - Alternative 1 : CRU/DES Homeporting
    - Alternative 2: LHD Homeporting
    - Alternative 5: ARG Homeporting
    - Alternative 6: CRU/DES Homeporting and LHD Homeporting
- **Group 2 – Alternatives Involving CVN Capability**. Each alternative involves a dredging project required to allow access and berthing without draft restrictions of one CVN. While no CVN would be homeported under any of the Group 2 alternatives, three of the four alternatives in this group also include homeporting of other surface ships. The four alternatives in Group 2 include:
    - Alternative 3: CVN Capable
    - Alternative 7: CRU/DES Homeporting and CVN Capable
    - Alternative 9: LHD Homeporting and CVN Capable
    - Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable

Table 2.1-1 Ships, Crew, and Other Personnel Associated with Each Alternative

Alternative		Ship Type	No. Ships	Ships Crew[1]			Other Personnel[2]				Total Personnel For Alternative[3]
				Officer	Enlisted	Total	Officer	Enlisted	Civilian	Total	
Group 1 -- Alternatives Involving Homeporting of Surface Ships (Non-CVN)											
1	CRU/DES Homeporting	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**	13	22	20	**55**	**1,790**
2	LHD Homeporting	LHD	2	146	2,018	**2,164**	0	5	10	**15**	**2,179**
5	ARG Homeporting	LHD	1	73	1,009	**1,082**					
		LPD	1	32	364	**396**					
		LSD	1	19	291	**310**	17	27	10	**54**	**1,842**
6	CRU/DES Homeporting and LHD Homeporting[4]	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**	13	26	30	**69**	**3,968**
Group 2 -- Alternatives Involving CVN Capability											
3	CVN Capable	CVN	0	0	0	0	0	0	0	0	0
7	CRU/DES Homeporting and CVN Capable	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		CVN	0	0	0	**0**	13	22	20	**55**	**1,790**
9	LHD Homeporting and CVN Capable	LHD	2	146	2,018	**2,164**					
		CVN	0	0	0	**0**	0	5	10	**15**	**2,179**
11	CRU/DES Homeporting and LHD Homeporting and CVN Capable[3]	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**					
		CVN	0	0	0	**0**	13	26	30	**69**	**3,968**
Group 3 -- Alternatives Involving Homeporting of a CVN											
4	CVN Homeporting	CVN	1	159	2,981	**3,140**	0	0	50	**50**	**3,190**
8	CRU/DES Homeporting and CVN Homeporting	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**	13	22	20	**55**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**4,980**
10	LHD Homeporting and CVN Homeporting	LHD	2	146	2,018	**2,164**	0	5	10	**15**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**5,369**
12	CRU/DES Homeporting and LHD Homeporting and CVN Homeporting[3]	DDG	4	128	1,392	**1,520**					
		FFG	1	17	198	**215**					
		LHD	2	146	2,018	**2,164**	13	26	30	**69**	
		CVN	1	159	2,981	**3,140**	0	0	50	**50**	**7,158**

Notes: [1] Ships crew numbers are approximations and subject to change.
[2] Other Personnel includes officer, enlisted, and civilian personnel assigned to the Afloat Training Group (ATG) or to ship maintenance organizations.
[3] Total Personnel reflects the total number of additional personnel proposed as part of each alternative. This total does not consider deployment factors and is not representative of base loading (i.e., the number of personnel that would be present at NAVSTA Mayport). Base loading estimates that consider the proposed additional personnel as well as other factors affecting the base population are shown in Table 2.1-2.
[4] Enlisted Other Personnel (26) is not the sum of CRU/DES (22) and LHD (5) alternatives because of ATG personnel efficiency in combining alternatives.

Sources: NAVFAC Criteria Office 2006, Robusto 2006, SERMC 2006, Morales 2006, Agnor 2007

- **Group 3 – Alternatives Involving Homeporting of a CVN**. Each alternative includes homeporting a CVN, a dredging project (same as Group 2 alternatives), and construction of CVN nuclear propulsion plant maintenance facilities. Homeporting of other surface ships is included in all but one alternative. The four alternatives in Group 3 include:
  - Alternative 4: CVN Homeporting
  - Alternative 8: CRU/DES Homeporting and CVN Homeporting
  - Alternative 10: LHD Homeporting and CVN Homeporting
  - Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting.

The CVN homeporting (Group 3) and CVN capable (Group 2) alternatives for the CVN differ. The CVN homeporting alternative would permanently assign the CVN and personnel to NAVSTA Mayport and provide adequate facilities to perform depot-level maintenance at that location. The CVN capable alternative does not involve the homeporting of a CVN, but would only provide adequate services, berthing, and access to a fully loaded CVN without draft restrictions for visits of up to 21 days at a time (depot-level maintenance facilities are not required if the CVN is not homeported). More detailed descriptions of each alternative are provided in Sections 2.2 through 2.5.

Table 2.1-1 above provides a summary of additional ships, crew, and other personnel associated with those ships for each alternative. The ships proposed for homeporting would be in addition to the ships already homeported at NAVSTA Mayport. Additional ships crew and other personnel, including officer, enlisted, and civilian assigned to the ATG, SERMC, or CVN nuclear propulsion plant maintenance facilities as part of each alternative are also provided in the table. This table reflects the total number of additional personnel proposed for reassignment to NAVSTA Mayport, but does not consider deployment factors and is not representative of base loading (i.e., the number of personnel that would be present at NAVSTA Mayport at any one time). Base loading estimates that consider these proposed additional personnel as well as other factors affecting the base population are shown in Table 2.1-2.

Table 2.1-2 below summarizes the total number of homeported ships and the baseline and end state net daily populations for each alternative when considering projected future changes in base loading at NAVSTA Mayport. The net daily population considers the total number of personnel assigned to NAVSTA Mayport in a given year and applies a deployment factor as appropriate to provide an estimated average daily population. For example ships' crew are expected to be in port only 73 percent of the time, whereas non-deploying military and civilian staff likely would be present year-round.

Using information regarding future base population changes (i.e., organizational changes or ship decommissioning) and projecting the mix of ship types and numbers homeported in the future, allows for the estimation of net daily population at NAVSTA Mayport as shown in Table 2.1-2.

Some of the net daily population numbers presented in Table 2.1-2 in the FEIS differ from those presented in the DEIS. In particular, the No Action Alternative end state net daily population would be less than presented in the DEIS because future manning levels at SERMC have been revised based on further discussions with NAVSTA Mayport SERMC staff. Also, the net daily population for all Group 3 alternatives is less than presented in the DEIS because the proposed infrastructure completion date and earliest CVN homeporting date has slipped from 2012 to 2014 which postpones the influx of maintenance personnel associated with CVN propulsion plant maintenance to sometime beyond 2015 depending on particular CVN maintenance schedules. Furthermore, calculations based on the population numbers from Table 2.1-2 are rounded when discussed in the text throughout the FEIS.

The baseline year, 2006, best represents recent operations at NAVSTA Mayport which have historically included a carrier (see Section 1.3). 2006 was the final full year of operations for the KENNEDY prior to its decommissioning in 2007. When fully operational the KENNEDY's ship's crew exceeded 3,000 personnel. In 2005, however, the KENNEDY's operational status changed and the crew size was reduced to a low of 2,215. Between 2005 and 2006, crew size fluctuated and was at a high of 2,498 in August 2006 prior to beginning the decommissioning process in January 2007. Between January and July 2007, KENNEDY manning was gradually reduced from 2,243 to 421. The KENNEDY was towed from NAVSTA Mayport on 24 July 2007 and officially decommissioned on 30 September 2007. The baseline year, therefore, includes KENNEDY personnel loading of 2,498. While more than 16,000 personnel were assigned to NAVSTA Mayport in 2006, as shown in Table 2.1-2, the baseline year net daily population was approximately 13,300.

For analysis purposes an end state year, representing the year by which all proposed alternatives could be fully implemented, has been chosen. That year, 2014, takes into account the additional personnel proposed by the various alternatives (see Table 2.1-1), as well as other unrelated personnel changes due to decommissioning of the KENNEDY in 2007 and the decommissioning of 10 FFGs (one as early as 2010, total of four as early as 2012, total of seven as early as 2013, and total of 10 as early as 2014). Deployment factors, maintenance schedules, and SERMC personnel downsizing (from approximately 1,504 in 2006 to 965 in 2008) also are taken into consideration for base loading projections.

Table 2.1-2 Net Daily Population and Number of Ships Homeported at NAVSTA Mayport under Each Alternative

Group 1 - Alternatives Involving Homeporting of Surface Ships (Non-CVN)						
			End State[7]			
	Baseline[6]	**No Action[7]**	**Alternative 1: CRU/DES Homeporting**	**Alternative 2: LHD Homeporting**	**Alternative 5: ARG Homeporting**	**Alternative 6: CRU/DES Homeporting and LHD Homeporting**
Nondeploying Population	6,210	5,671	5,726	5,686	5,725	5,740
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ ATG Staff[2]	0	0	35	5	44	39
Ships Maintenance Personnel[3]	1,504	965	985	975	975	995
Ships Personnel in Port[4]	6,036	2,643	3,753	4,223	3,949	5,333
Air Squadrons[5]	1,026	1,026	1,026	1,026	1,026	1,026
Net Daily Population	**13,272**	**9,340**	**10,505**	**10,935**	**10,699**	**12,098**
Number of Ships Homeported[8]	**22**	**11**	**15**	**13**	**14**	**17**

This table summarizes the total number of homeported ships and the baseline and end state net daily populations for each alternative when considering projected future changes in base loading at NAVSTA Mayport. The net daily population considers the total number of personnel assigned to NAVSTA Mayport in a given year and applies a deployment factor as appropriate for ship loading to provide an estimated average daily population. For example ships' crews are expected to be in port only 73 percent of the time, whereas non-deploying military and civilian staff likely would be present year-round. Using information regarding future base population changes (i.e., organizational changes or ship decommissioning) and projecting the mix of ship types and numbers homeported in the future, allows for the estimation of net daily population at NAVSTA Mayport for each alternative.

Notes:

1. Because the proposed action and alternative would not affect this population, this population is assumed as a constant.
2. Includes staff associated with alternatives that homeport a DESRON or PHIBRON administrative staff at NAVSTA Mayport. Also includes increases in ATG Staff. DESRON and ATG staffs currently based at NAVSTA Mayport are included in Other Station Personnel line.
3. Non-CVN ships maintenance includes SERMC personnel plus annual average contractor personnel based on man-day estimates. Estimates of approximately 629 SERMC personnel downsizing between baseline and 2009 is included (this would occur regardless of ships homeporting). The military personnel downsizing will be offset somewhat by contractors, for a net reduction in ships maintenance personnel of approximately 539. Assumes CVN will conduct a six-month maintenance availability every two years beginning within three years of being homeported, depending on the ship's particular maintenance cycle. The first two of these six-month periods would be conducted in the ship's homeport. Every third maintenance availability would be conducted in dry-dock at a nuclear-capable shipyard. Beginning in 2014, CVN nuclear propulsion plant maintenance facility manning would be approximately 50 personnel when no CVN maintenance is being conducted. Approximately 750 additional CVN propulsion plant maintenance personnel would be present for each six-month maintenance availability conducted at NAVSTA Mayport (amounting to an increase of 375 in the annual net daily population in those years). It is assumed that the first CVN six-month maintenance availability at NAVSTA Mayport would occur sometime after 2015, which is beyond the planning period of this document.
4. Includes 73 percent deployment factor.
5. Includes 67 percent deployment factor.
6. Baseline loading is from 2006 and includes the KENNEDY loading at 2,498 (or 1,824 average net daily population when applying the 73 percent deployment factor).
7. End state is for 2014 and includes the decommissioning of the KENNEDY in 2007, and scheduled decommissioning of 10 FFGs (1 in 2010, 3 in 2012, 3 in 2013, and 3 in 2014).
8. For Alternatives 1, 6, 7, 8, 11, and 12 which involve the CRU/DES homeporting, the additional FFG homeported in 2009 as part of these alternatives would also be decommissioned as early as 2014; thus a total of 11 FFGs would be decommissioned by the end state year of 2014 for those alternatives.

Sources: DoN 2006a, NAVFAC Criteria Office 2006, Robusto 2006, Agnor 2006, Morales 2006, Agnor 2007

Note: Table 2.1-2 is continued on next page

Group 2 - Alternatives Involving CVN Capability						
			End State[7]			
	Baseline[6]	**No Action[7]**	**Alternative 3: CVN Capable**	**Alternative 7: CRU/DES Homeporting and CVN Capable**	**Alternative 9: LHD Homeporting and CVN Capable**	**Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable**
Nondeploying Population	6,210	5,671	5,671	5,726	5,686	5,740
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ ATG Staff[2]	0	0	0	35	5	39
Ships Maintenance Personnel[3]	1,504	965	965	985	975	995
Ships Personnel in Port[4]	6,036	2,643	2,643	3,753	4,223	5,333
Air Squadrons[5]	1,026	1,026	1,026	1,026	1,026	1,026
Net Daily Population	**13,272**	**9,340**	**9,340**	**10,505**	**10,935**	**12,098**
Number of Ships Homeported[8]	**22**	**11**	**11**	**15**	**13**	**17**

Group 3 - Alternatives Involving Homeporting of a CVN						
			End State[7]			
	Baseline[6]	**No Action[7]**	**Alternative 4: CVN Homeporting**	**Alternative 8: CRU/DES Homeporting and CVN Homeporting**	**Alternative 10: LHD Homeporting and CVN Homeporting**	**Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting**
Nondeploying Population	6,210	5,671	5,721	5,776	5,736	5,790
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ ATG Staff[2]	0	0	0	35	5	39
Ships Maintenance Personnel[3]	1,504	965	1,015	1,035	1,025	1,045
Ships Personnel in Port[4]	6,036	2,643	4,936	6,045	6,515	7,625
Air Squadrons[5]	1,026	1,026	1,026	1,026	1,026	1,026
Net Daily Population	**13,272**	**9,340**	**11,682**	**12,847**	**13,277**	**14,441**
Number of Ships Homeported[8]	**22**	**11**	**12**	**16**	**14**	**18**

See notes on previous page for Group 1 alternatives.

In addition, note that Net Daily Population for all Group 3 alternatives is less than presented in the DEIS because the proposed infrastructure completion date and earliest CVN homeporting date has slipped from 2012 to 2014, which postpones the influx of maintenance personnel associated with CVN propulsion plant maintenance to sometime beyond 2015 depending on particular CVN maintenance schedules.

Due to the decommissioning of the KENNEDY and 10 FFGs, the end state for all of the alternatives is a decrease in the number of ships homeported at NAVSTA Mayport as compared to the baseline. While all action alternatives except Alternative 3 propose homeporting additional ships and personnel at NAVSTA Mayport, as shown in Table 2.1-2, all alternatives in Groups 1 and 2 and two alternatives in Group 3 (Alternatives 4 and 8) would ultimately result in a decrease in the net daily population of the Station. Group 3 Alternative 10 would result in essentially the same net daily population and Group 3 Alternative 12 would result in an increase in the net daily population of NAVSTA Mayport.

It should be noted that decommissioning schedules are subject to change dependent on world conditions, thus it is possible that the planned FFG decommissioning dates could change. Furthermore, currently unforeseen circumstances also could result in consideration of homeporting other fleet ships at NAVSTA Mayport between 2009 and 2014. This EIS, however, has been prepared based on the best available data for the foreseeable future homeporting of surface ships at NAVSTA Mayport.

Sections 2.3 through 2.5 describe each alternative in more detail, provide additional information on estimated annual fluctuations in net daily population, and illustrate the proposed berthing plans for each alternative. To describe the annual fluctuations in net daily population, a table similar to Table 2.1-2 is provided specifically for each alternative, which shows estimates for the 2006 baseline and all years from 2009 through the 2014 end state. The berthing plans provided for each alternative are based on Naval Facilities Engineering Command (NAVFAC) planning criteria identified in Uniform Facilities Criteria 2-000-05N (NAVFAC 2005) for port loading as adjusted per the FRP to be calculated at 73 percent of the total ship loading. Thus the graphic depicting the berthing plan for each alternative does not show every homeported ship; rather the graphic shows 73 percent of each ship type (rounded up to "whole" ships) because it can be expected that no more than 73 percent of each ship type would be in port at any given time.

All alternatives except for action Alternatives 2, 3, and 9 and the No Action Alternative involve construction. In accordance with NAVFAC Instruction 9830.1, Sustainable Development Policy (NAVFAC 2003), all new construction will be designed and built to meet the Leadership in Energy and Environmental Design (LEED)-certified level, where practicable. An Assistant Secretary of Navy (Installations and Environment) Memorandum, dated 4 August 2006, directs planning, programming, and budgeting to meet requirements in the Energy Policy Act of 2005, Federal Leadership in High Performance and Sustainable Buildings Memorandum of Understanding, and at least LEED Silver level rating performance in new and replacement buildings. NAVFAC is developing interim guidance to implement the Assistant Secretary of Navy memorandum. LEED for New Construction offers many benefits including environmental, economic, and occupant-oriented performance and health advantages.

2.2 DESCRIPTION OF ALTERNATIVES INVOLVING HOMEPORTING OF SURFACE SHIPS (NON-CVN)

2.2.1 ELEMENTS COMMON TO GROUP 1 ALTERNATIVES

The following fundamental components are common to all Group 1 alternatives:

- Maintenance requirements of additional ships would be served by SERMC and existing shipyards at NAVSTA Mayport;
- There is adequate space, including full utility services requirements, to provide berthing by 2014 for all ships considered under each alternative;
- Homeporting of ships considered under each alternative could be implemented as early as 2009 and has been assumed for planning purposes;
- The number of ships homeported and the average net daily population would decrease from the 2006 baseline until 2009 due to decommissioning of the KENNEDY in 2007; these numbers would continue to decrease commensurate with scheduled decommissioning of FFGs from 2010 through 2014; and
- CVN visits could continue to occur subject to current draft restrictions (see Section 2.3.1)

2.2.2 ALTERNATIVE 1: CRU/DES HOMEPORTING

Under Alternative 1, additional DESRON staff and five additional ships (four DDGs and one FFG) would be homeported at NAVSTA Mayport. The five ships could arrive for homeporting as early as 2009, but it should be noted that the proposed FFG also could be decommissioned as early as 2014. The additional DESRON staff would consist of 13 officers and 12 enlisted personnel. The average crew for each DDG would consist of 32 officers and 348 enlisted for a total of 380 personnel per DDG or for a total of 1,520 personnel for all four DDGs. The average crew for the FFG would be 17 officers and 198 enlisted personnel for a total of 215 personnel. Therefore, the estimated total crew loading associated with this alternative would be 1,735 ships crew personnel.

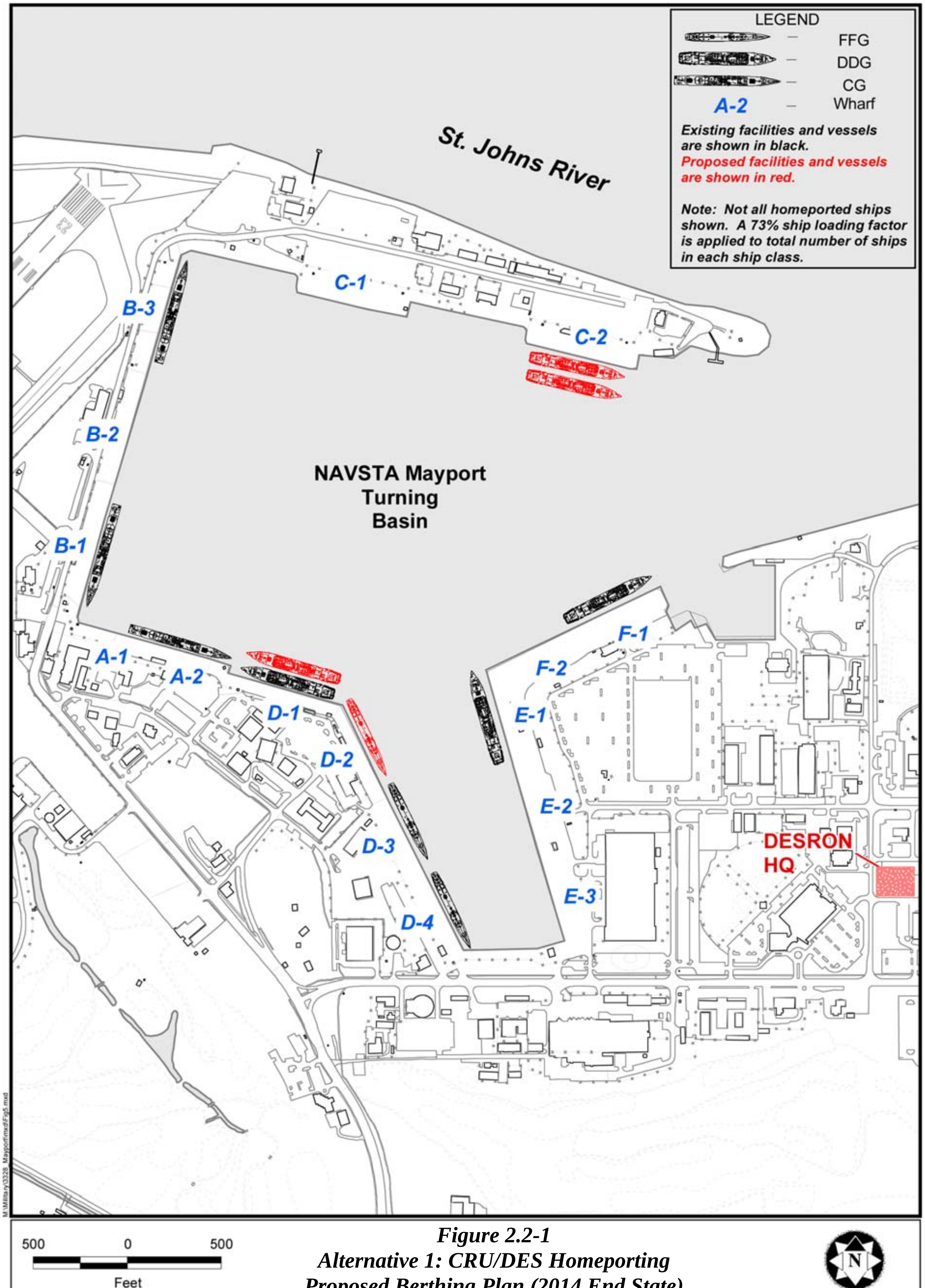


Figure 2.2-1
Alternative 1: CRU/DES Homeporting
Proposed Berthing Plan (2014 End State)

In addition, an estimated 20 additional civilian personnel (ship building specialists and contract administrators) would be added to SERMC and 10 enlisted personnel would be added to ATG Mayport. The estimated total new personnel associated with Alternative 1, including the DESRON staff would be approximately 1,800 personnel (see Table 2.1-1).

Table 2.2-1 Alternative 1 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State**[7]
Nondeploying Population	6,210	5,726	5,726	5,726	5,726	5,726	5,726
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	35	35	35	35	35	35
Ships Maintenance Personnel[3]	1,504	985	985	985	985	985	985
Ships Personnel in Port[4]	6,036	5,479	5,322	5,322	4,852	4,381	3,753
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,231**	**12,074**	**12,074**	**11,603**	**11,133**	**10,505**
Number of Ships Homeported[8]	**22**	**26**	**25**	**25**	**22**	**19**	**15**

Notes: See Table 2.1-2 notes

In Table 2.2-1, when considered in context of decommissioning of the KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, decommissioning of the proposed FFG as early as 2014, and reduction in military personnel at SERMC, there would be a net loss of approximately 2,800 personnel at NAVSTA Mayport between the 2006 baseline year and 2014. Under this alternative, a maximum of 26 ships would be homeported in 2009 and a minimum of 15 ships homeported at the end of the planning period in 2014.

As part of this alternative, a new DESRON headquarters building (6,000 sf) would be constructed to include offices, equipment room, and a secure communication space. The DESRON headquarters building would be located east of Bon Homme Richard St. north of its intersection with Massey Ave. Figure 2.2-1 depicts the location for the new DESRON headquarters building and the berthing plan for the 2014 end state for this alternative.

2.2.3 ALTERNATIVE 2: LHD HOMEPORTING

Under Alternative 2, two LHDs would be homeported at NAVSTA Mayport. Each LHD would have an average crew of 73 officers and 1,009 enlisted personnel, for an estimated gain of 2,164 personnel (crew) stationed at NAVSTA Mayport under this alternative. In addition, an estimated five enlisted personnel would be added to ATG Mayport to support training requirements and 10 civilian employees would be added to SERMC. Therefore, the total gain in personnel associated with this alternative would be approximately 2,200 personnel (see Table 2.1-1).

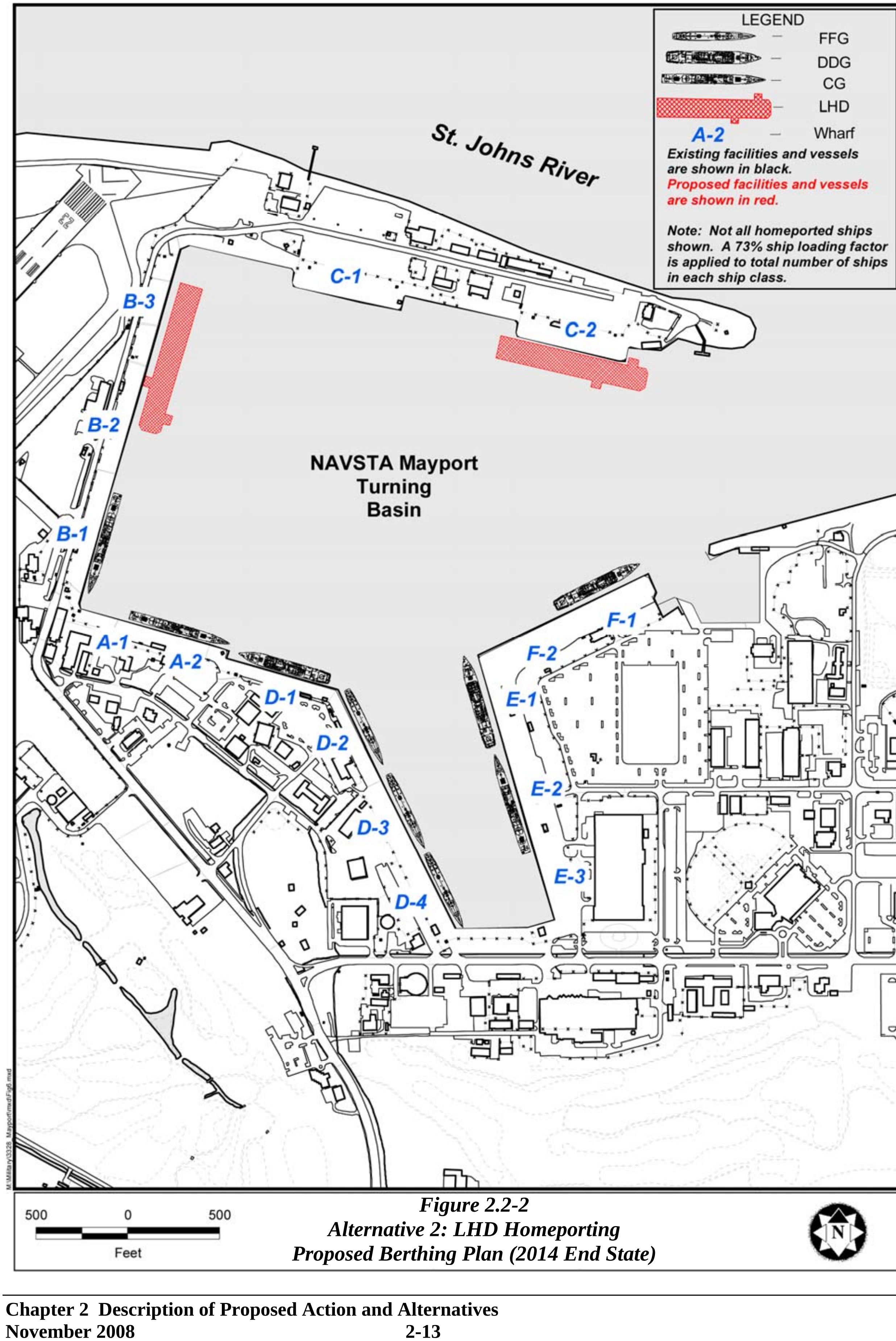


Figure 2.2-2
Alternative 2: LHD Homeporting
Proposed Berthing Plan (2014 End State)

As shown below in Table 2.2-2 which incorporates base loading projections that account for the crew and staff losses associated with the decommissioning of the KENNEDY in 2007, the decommissioning of 10 FFGs between 2010 and 2014, and reduction in personnel at SERMC, the net daily population at NAVSTA Mayport would decrease by approximately 2,300 personnel between the 2006 baseline year and 2014. The number of ships homeported would be 23 in 2009, but decrease to 13 by 2014.

Table 2.2-2 Alternative 2 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State**[7]
Nondeploying Population	6,210	5,686	5,686	5,686	5,686	5,686	5,686
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	5	5	5	5	5	5
Ships Maintenance Personnel[3]	1,504	975	975	975	975	975	975
Ships Personnel in Port[4]	6,036	5,793	5,636	5,636	5,165	4,694	4,223
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,504**	**12,347**	**12,347**	**11,877**	**11,406**	**10,935**
Number of Ships Homeported	**22**	**23**	**22**	**22**	**19**	**16**	**13**

Notes: See Table 2.1-2 notes

The current facilities infrastructure at NAVSTA Mayport would support the alternative without requiring new support facilities. Figure 2.2-2 depicts the proposed 2014 end state berthing plan for this alternative.

2.2.4 ALTERNATIVE 5: ARG HOMEPORTING

Under Alternative 5, PHIBRON staff and three additional ships (one LHD, one LPD, and one LSD) would be homeported at NAVSTA Mayport. The average crew of the LHD ship would be 73 officers and 1,009 enlisted; the average crew of the LPD would be 32 officers and 364 enlisted; and the average crew of the LSD would be 19 officers and 291 enlisted. The total estimated gain in ships' crew stationed at NAVSTA Mayport would be 1,788. The PHIBRON staff also would add 17 officers and 21 enlisted, for a total of 38 additional PHIBRON staff personnel. In addition, there would be an estimated gain of 10 civilian personnel at SERMC and six additional enlisted personnel at ATG Mayport. The total gain in personnel stationed at NAVSTA Mayport under Alternative 5 would be approximately 1,800 personnel (see Table 2.1-1). However, as shown in Table 2.2-3, with KENNEDY and scheduled FFG decommissioning and SERMC military personnel downsizing, there would be a net loss of approximately 2,600 in the net daily population at NAVSTA Mayport between the 2006 baseline year and end state year of 2014. The number of ships homeported decreases from 22 in 2006 to 14 in 2014.

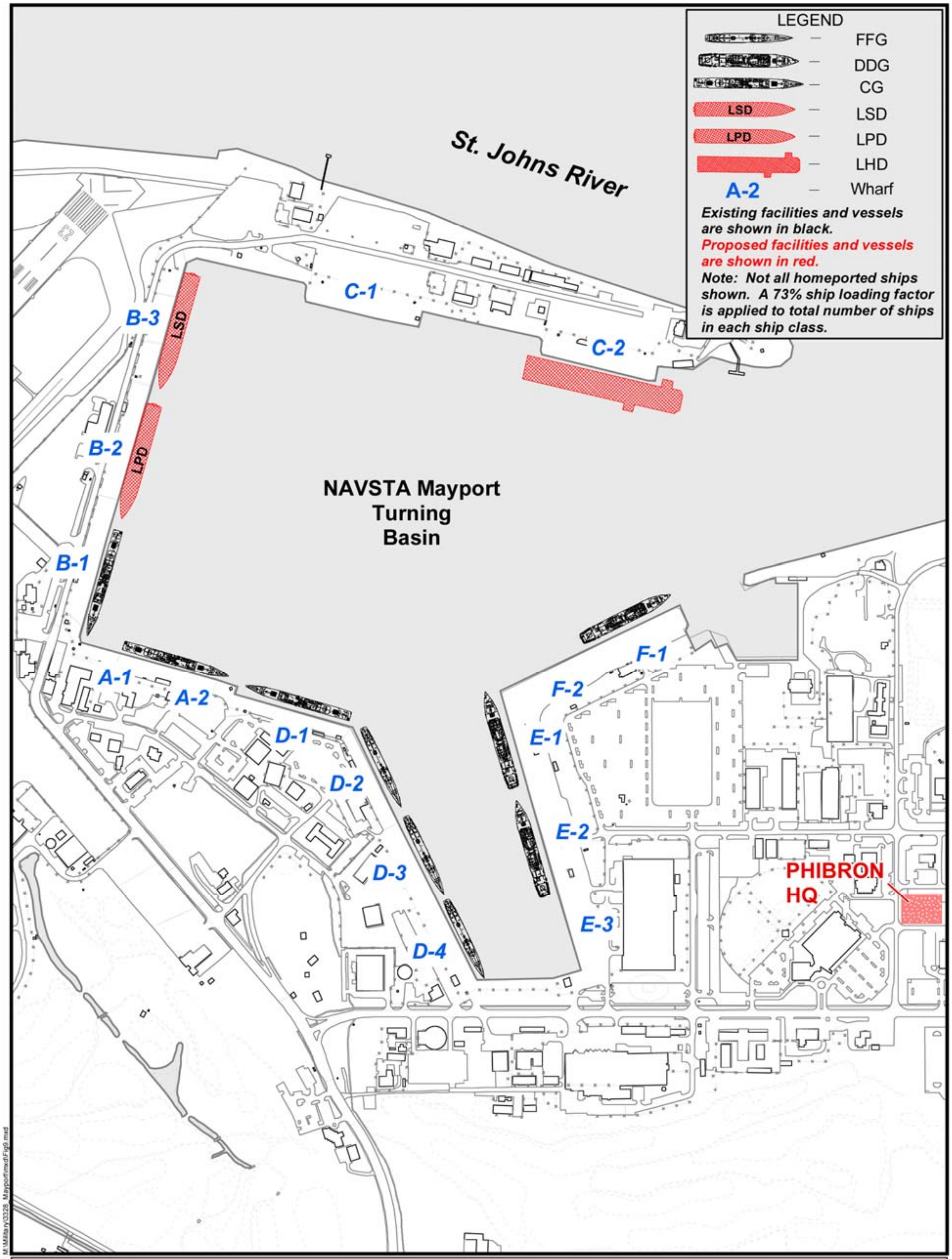


Figure 2.2-3
Alternative 5: ARG Homeporting
Proposed Berthing Plan (2014 End State)

Table 2.2-3 Alternative 5 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	2009	2010	2011	2012	2013	2014 End State[7]
Nondeploying Population	6,210	5,725	5,725	5,725	5,725	5,725	5,725
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	44	44	44	44	44	44
Ships Maintenance Personnel[3]	1,504	975	975	975	975	975	975
Ships Personnel in Port[4]	6,036	5,518	5,361	5,361	4,890	4,419	3,949
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,269**	**12,112**	**12,112**	**11,641**	**11,170**	**10,699**
Number of Ships Homeported	**22**	**24**	**23**	**23**	**20**	**17**	**14**

Notes: See Table 2.1-2 notes

A new PHIBRON Command Building would be needed for 38 PHIBRON staff personnel at NAVSTA Mayport. It would be approximately 9,000 sf and include offices, equipment room, and secure communication space. The PHIBRON Command Building would be located east of Bon Homme Richard St. north of its intersection with Massey Ave. Figure 2.2-3 depicts the location for the new PHIBRON Command Building and the berthing plan for the 2014 end state for this alternative.

2.2.5 ALTERNATIVE 6: CRU/DES HOMEPORTING AND LHD HOMEPORTING

Alternative 6 combines Alternatives 1 and 2 homeporting options. Additional DESRON staff and a total of seven additional ships (four DDGs, one FFG, and two LHDs) would be homeported at NAVSTA Mayport. The seven ships could arrive for homeporting as early as 2009, but it should be noted that the proposed FFG also could be decommissioned as early as 2014. The estimated total gain in crew associated with Alternative 6 would be 3,899. The DESRON staff would add another 13 officers and 12 enlisted other personnel. In addition, there would be an estimated gain of 30 SERMC civilians and 14 ATG Mayport enlisted personnel. Thus, the total gain in personnel stationed at NAVSTA Mayport under Alternative 6 is approximately 4,000 (see Table 2.1-1). As shown in Table 2.2-4, when considered in context of decommissioning of the KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, decommissioning of the proposed FFG as early as 2014, and reduction in military personnel at SERMC, there would be a net loss of approximately 1,200 personnel at NAVSTA Mayport between the 2006 baseline year and 2014. The number of ships would increase from 22 to 28 by 2009, but would decrease to 17 by 2014.

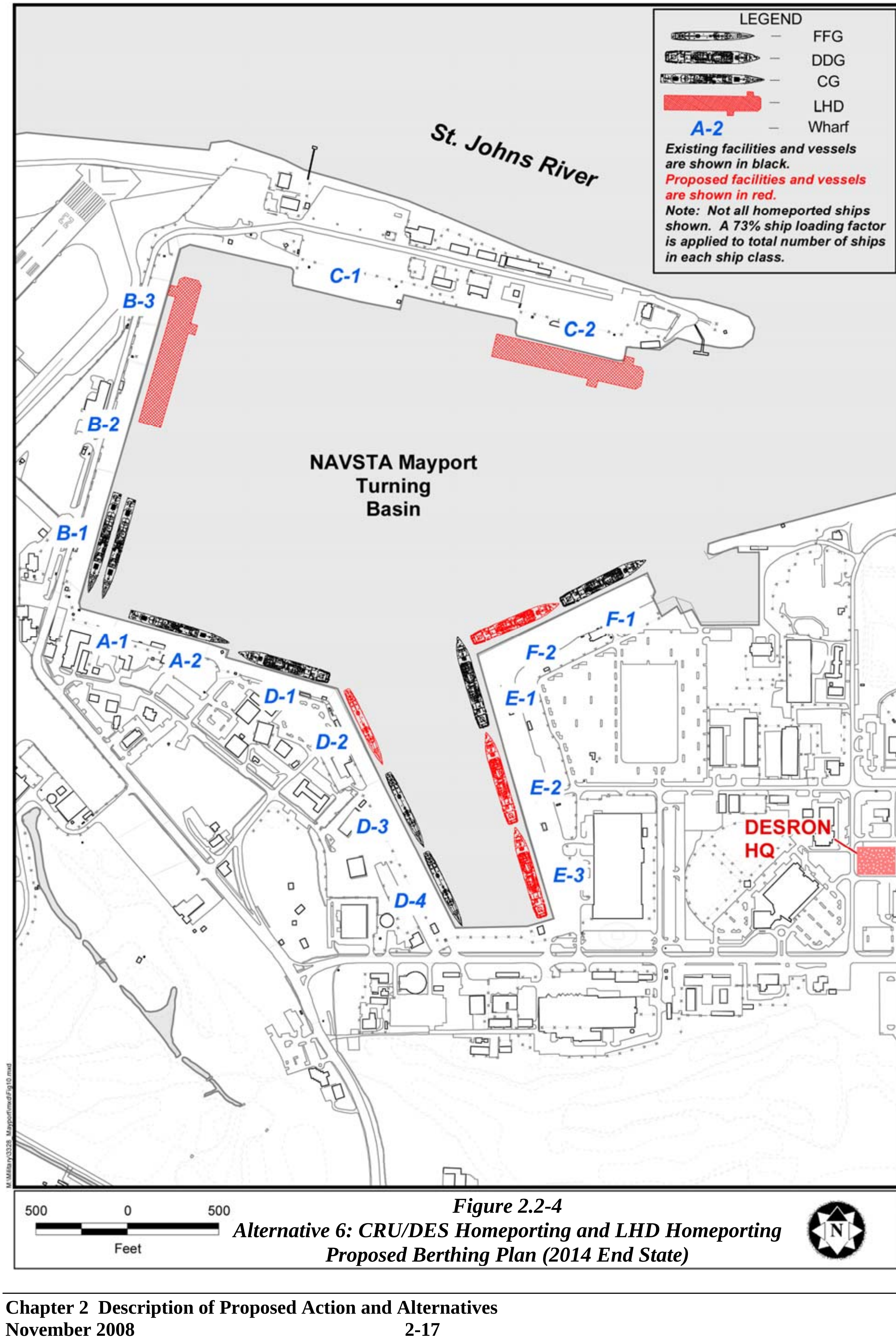


Figure 2.2-4
Alternative 6: CRU/DES Homeporting and LHD Homeporting Proposed Berthing Plan (2014 End State)

Table 2.2-4 Alternative 6 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	2009	2010	2011	2012	2013	2014 End State[7]
Nondeploying Population	6,210	5,740	5,740	5,740	5,740	5,740	5,740
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	39	39	39	39	39	39
Ships Maintenance Personnel[3]	1,504	995	995	995	995	995	995
Ships Personnel in Port[4]	6,036	7,059	6,902	6,902	6,431	5,960	5,333
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**13,825**	**13,668**	**13,668**	**13,197**	**12,726**	**12,098**
Number of Ships Homeported[8]	**22**	**28**	**27**	**27**	**24**	**21**	**17**

Notes: See Table 2.1-2 notes

As with Alternative 1, a new 6,000 sf DESRON headquarters building would be constructed as shown in Figure 2.2-4, along with the berthing plan for the 2014 end state for this alternative.

2.3 DESCRIPTION OF ALTERNATIVES INVOLVING CVN CAPABILITY

2.3.1 ELEMENTS COMMON TO GROUP 2 ALTERNATIVES

In addition to the elements that are common to all Group 1 alternatives, the following fundamental components are common to all Group 2 alternatives:

- Dredging of the NAVSTA Mayport turning basin and entrance channel and federal navigation channel (Jacksonville Harbor Bar Cut) over a period of 12 to 18 months beginning in 2011;
- Disposal of approximately 5.2 million cy of dredged material; and
- Accommodation of a visiting CVN as early as 2012 for up to 63 days per year, with no single visit lasting more than 21 days (approximately 3 visits per year).

Under all alternatives in this grouping, necessary improvements are required to make NAVSTA Mayport a CVN capable port. For this EIS, CVN capable refers to the capability of NAVSTA Mayport to provide adequate services, berthing, and access to a fully loaded CVN without draft restrictions. For all alternatives in this grouping, no CVNs would be homeported at NAVSTA Mayport. The CVN could begin visiting NAVSTA Mayport without draft restrictions as early as 2012, contingent upon the completion of a dredging project described below. Other ships proposed for homeporting as part of the Group 2 alternatives could arrive as early as 2009.

In general, CVN capable ports require increased shore electrical power, stronger wharf and mooring structures, and access to the port that is unrestricted by water depths. At NAVSTA Mayport, Wharf C-2 currently provides the necessary berthing depth (-50 ft), shore electrical power station (4160-volt) and mooring structures (Type II mooring dolphins) required to accommodate a non-homeported CVN. NAVSTA Mayport, however, is not currently accessible to a fully loaded CVN without draft restrictions. All aircraft carriers require a minimum of 6 ft beneath the keel to ensure cooling and firefighting system intakes do not get clogged or damaged by mud and debris from the sea and river bottom. A dredge depth of -50 ft Mean Lower Low Water (MLLW) is necessary for CVNs to meet this requirement under all ship loading and tidal conditions. The current water depth for the NAVSTA Mayport turning basin, entrance channel, and Jacksonville Harbor Bar Cut 3 federal navigation channel is maintained at approximately -42 below MLLW, although some portions of the federal navigation channel are naturally deeper than -42 ft MLLW.

The -42 ft water depth is adequate for safe transit of a CVN only if the ship is loaded to significantly less than its full capacity in order to reduce its draft, and/or the transiting occurs during periods of high tide. Historically, a CVN visits NAVSTA Mayport approximately once per year for less than three days under these conditions (Reeder 2007). To accommodate the CVN capable alternative, which provides unrestricted access, dredging to the required project depth of -50 ft would occur at the NAVSTA Mayport turning basin, entrance channel, and Jacksonville Harbor Bar Cut federal navigation channel.

2.3.1.1 Dredging Project

Dredging Location

Under this grouping of alternatives, the Navy would implement a dredging project to allow access and berthing without draft restrictions of a fully loaded CVN. The dredging project would include dredging within the federal navigation channel (Jacksonville Harbor Bar Cut 3, Areas 1 and 2), NAVSTA Mayport entrance channel, and NAVSTA Mayport turning basin (Figure 2.3-1). The current water depths of the NAVSTA Mayport turning basin, entrance channel, and Jacksonville Harbor Bar Cut 3 federal navigation channel are maintained at approximately -42 ft below MLLW. The turning basin is approximately 123 acres in size. The NAVSTA Mayport entrance channel is approximately 500 ft wide extending approximately 5,000 ft until it joins with the federal navigation channel. This portion of the federal navigation channel is called the Jacksonville Harbor Bar Cut 3. The federal navigation channel is 800 ft wide and extends eastward from the NAVSTA Mayport entrance channel (channel station 196+00) approximately 19,600 ft into the Atlantic Ocean (channel station 0+00), naturally increasing in depth from the maintained depth of -42 ft to greater than -55 ft MLLW. The inner portion of the Jacksonville Harbor Bar Cut 3 federal navigation channel is within the St. Johns River and extends approximately 3,000 ft from NAVSTA Mayport entrance channel (channel station 196+00) to the eastern end of the jetties (channel station 166+00; referred to as Area 2 in Figure 2.3-1).

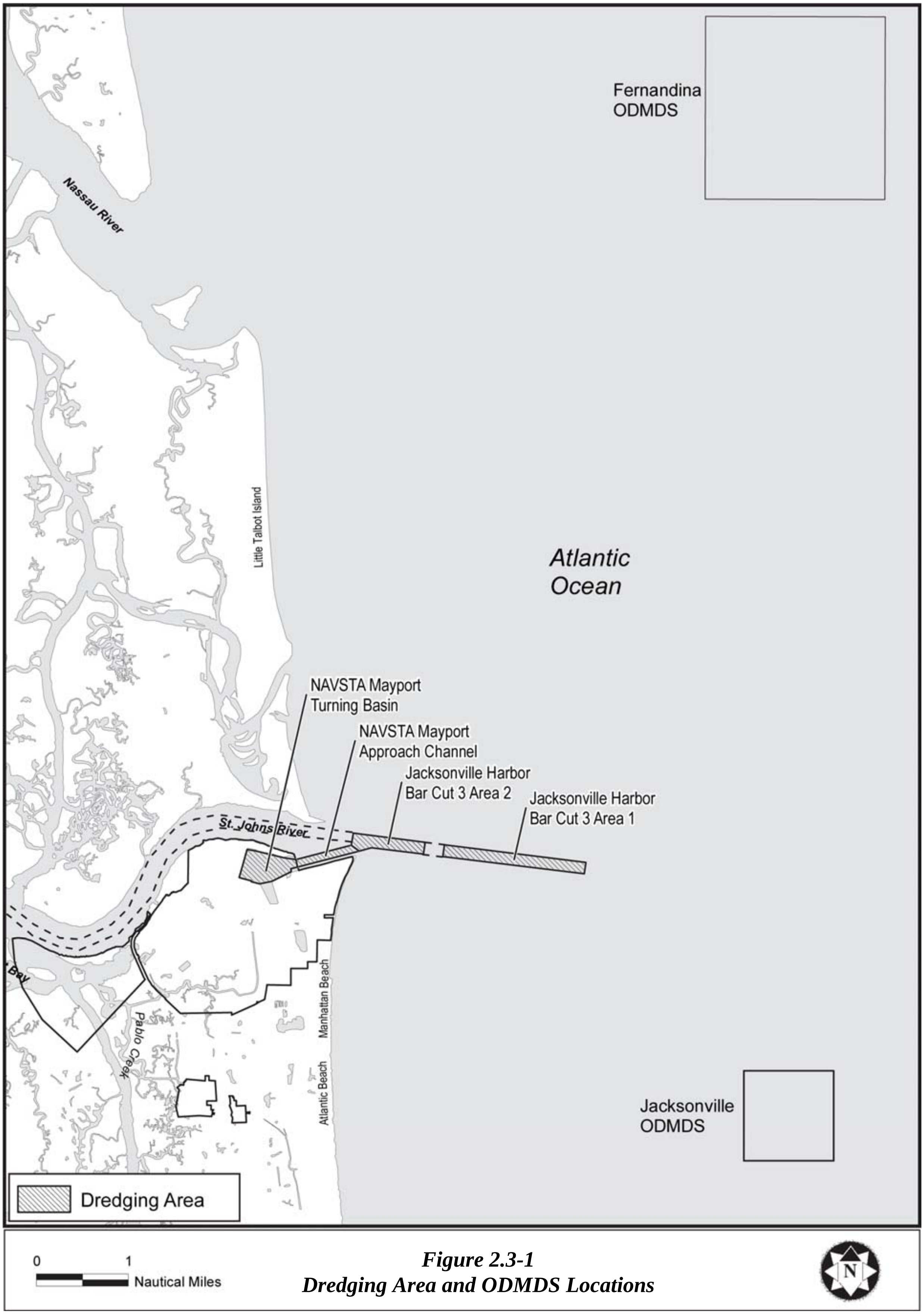


Figure 2.3-1
Dredging Area and ODMDS Locations

The outer portion of the Jacksonville Harbor Bar Cut 3 federal navigation channel, or Area 1, extends eastward from the jetties approximately 16,600 ft into the Atlantic Ocean (channel station 166+00 to channel station 0+00). Channel station 0+00 is the easternmost location designating the beginning of the federal navigation channel.

Figures 2.3-2 and 2.3-3 provide more detailed views of the proposed dredging areas. As shown, approximately three-fourths of the turning basin would be deepened to a total project depth of -52 ft MLLW to accommodate the required minimum turning radius of 1,650 ft for a CVN. The approximately 5,000 ft long, 500 ft wide entrance channel also would be deepened from an average depth of -42 ft MLLW to a depth of -54 ft MLLW for a length of approximately 5,000 ft.

Figure 2.3-3 shows the detail of portions of the proposed federal navigation channel dredging that would be 600 ft wide or 800 ft wide. As shown on the lower portion of this figure, existing water depths in this transition area generally are already deeper than the proposed -52 to -54 ft depth and will require less or no dredging at this location. The portion of the federal navigation channel within the jetties would be deepened within a 600 ft width (from channel station 185+00 to station 166+00) and the portion of the federal navigation channel east of the jetties would be deepened within an 800 ft width (from channel station 166+00 to station 0+00). The varying design widths of the project in the federal navigation channel are derived from Navy Technical Guidance for Facilities Homeporting Criteria for Nimitz Class Aircraft Carriers which consider differing wave action within breakwaters or jettied areas (600 ft minimum width) and outside breakwaters (800 ft width minimum). Within the federal navigation channel which extends eastward into waters naturally deeper than the proposed depth, dredging would only occur in locations shallower than the proposed depth.

Dredge Depth

To accommodate unrestricted access of a CVN, a project depth of -50 ft MLLW must be provided in the Mayport turning basin and entrance channel and federal navigation channel. The project depth, or authorized dimension, is the depth required by the Navy to meet its CVN minimum clearance criteria. The actual deepening would be to the -50 ft MLLW project depth, plus -2 ft of advanced maintenance (where necessary in fast-shoaling areas), and -2 ft of allowable overdepth for a total maximum depth of -54 ft MLLW. Advance maintenance is dredging to a specified depth beyond the authorized project depth in fast-shoaling areas to avoid frequent re-dredging and ensure the reliability and least overall cost of operating and maintaining the authorized project depth.

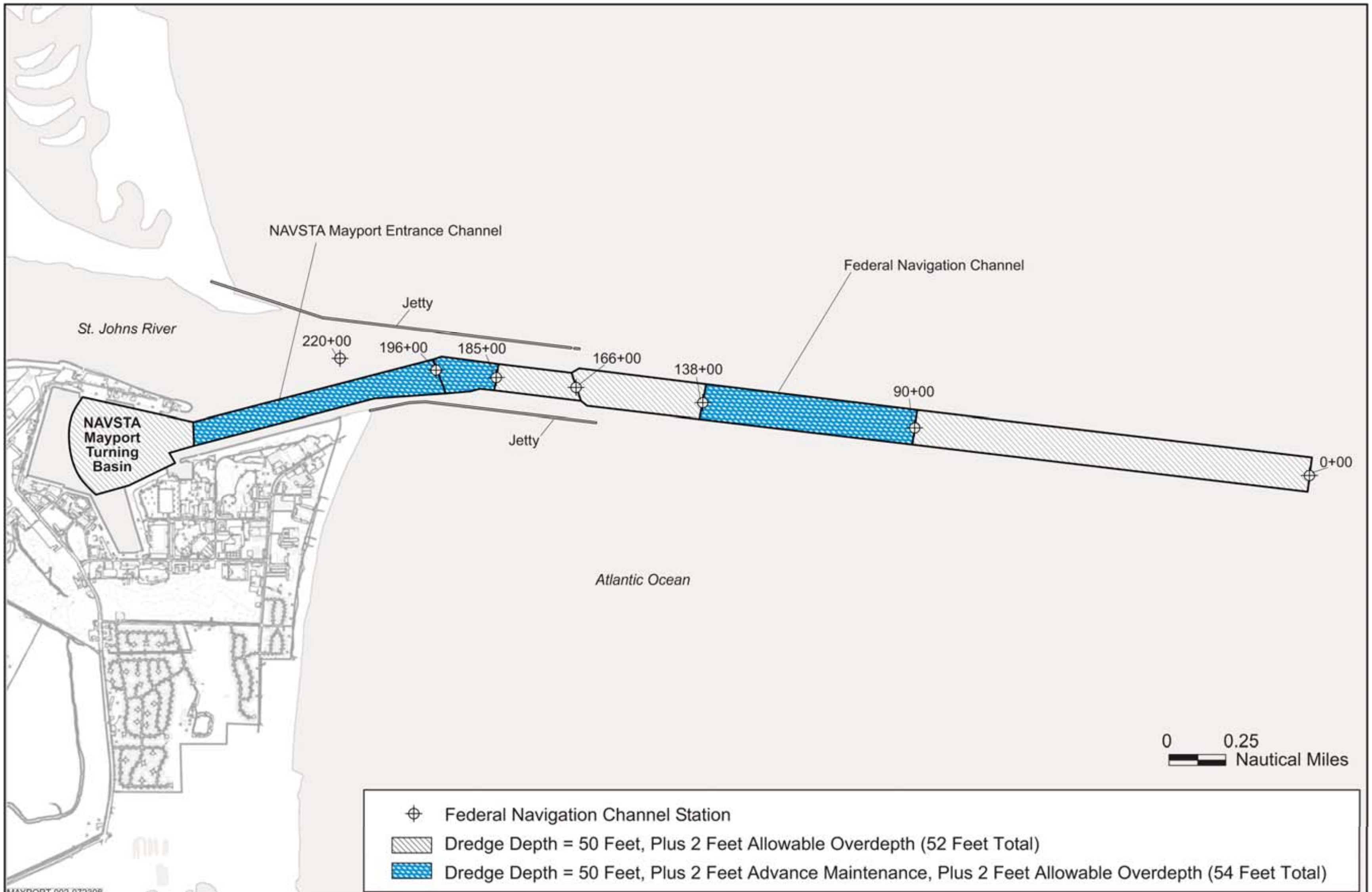


Figure 2.3-2
Proposed Dredge Depths

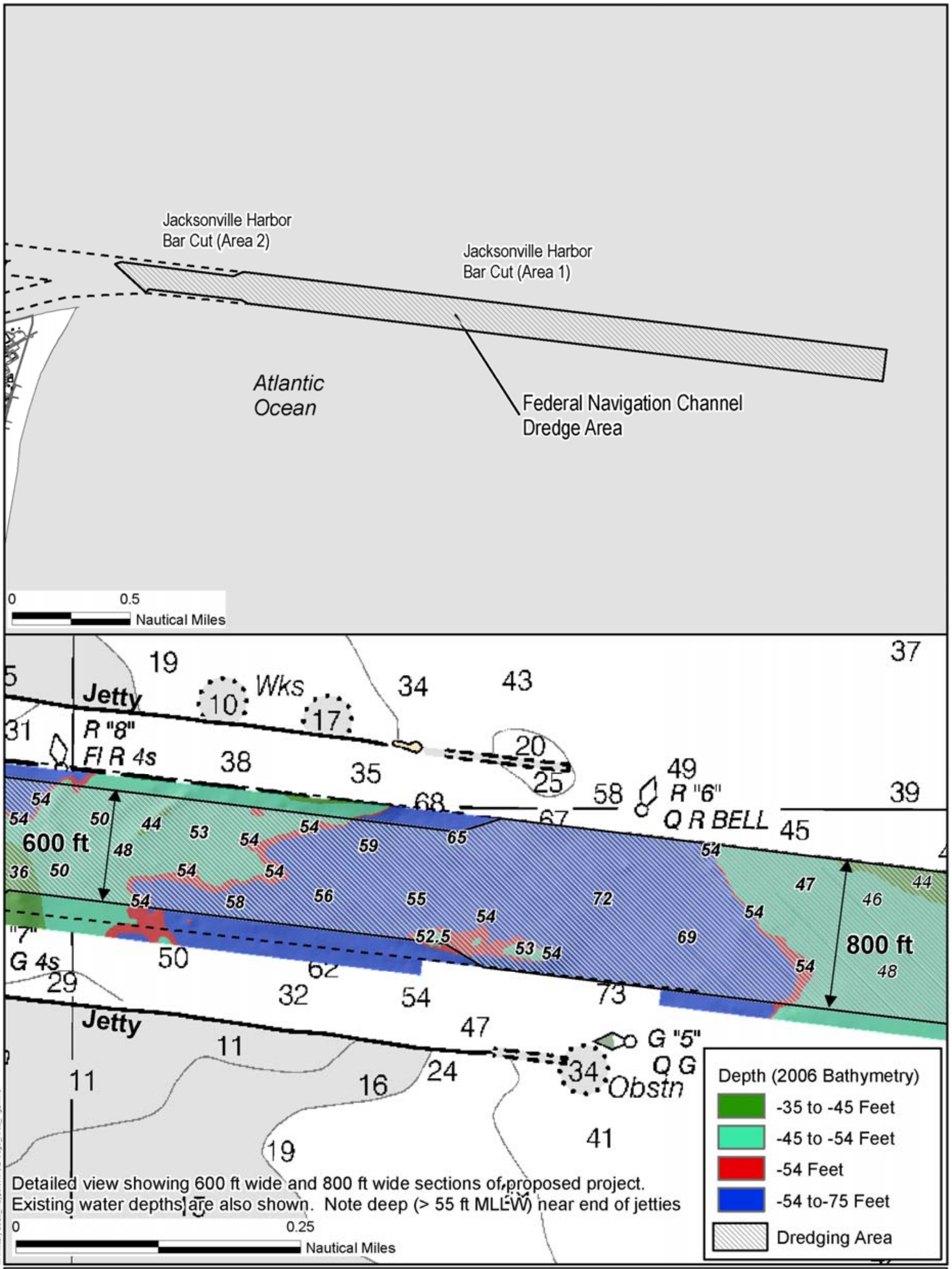


Figure 2.3-3
Dredging Area for Federal Navigation Channel

Note that the DEIS proposed advance maintenance for all project areas, but based on the results of hydrodynamic modeling (Appendix A.5) completed since publication of the DEIS and historical USACE maintenance dredging information, only three areas of the proposed project have been identified as needing advance maintenance: (1) the NAVSTA Mayport entrance channel, (2) federal navigation channel between stations 196+00 and 185+00, and (3) federal navigation channel between stations 138+00 and 90+00 (see Figure 2.3-2). Allowable overdepth, or "paid overdepth," is a construction design method for dredging that occurs outside the required project depth and advance maintenance depth to compensate for physical conditions and inaccuracies in the dredging process.

The term "allowable" in this context means that those dredging quantities are eligible for payment to the dredging contractor. Any further dredging that occurs beyond the allowable overdepth usually is not compensated, which generally controls the accuracy of the dredging process. It is possible, however, that some dredging may occur deeper than the allowable overdepth, which is referred to as "unpaid overdepth." Figure 2.3-4 illustrates the various dredging prism dimensions or zones. ("Dredging prism" refers to area defined by the top, sides, and bottom of the channel in which all material is to be removed.) Following the initial deepening project to a maximum total project depth of -54 ft MLLW, the depths would be maintained at -50 ft MLLW in the future.

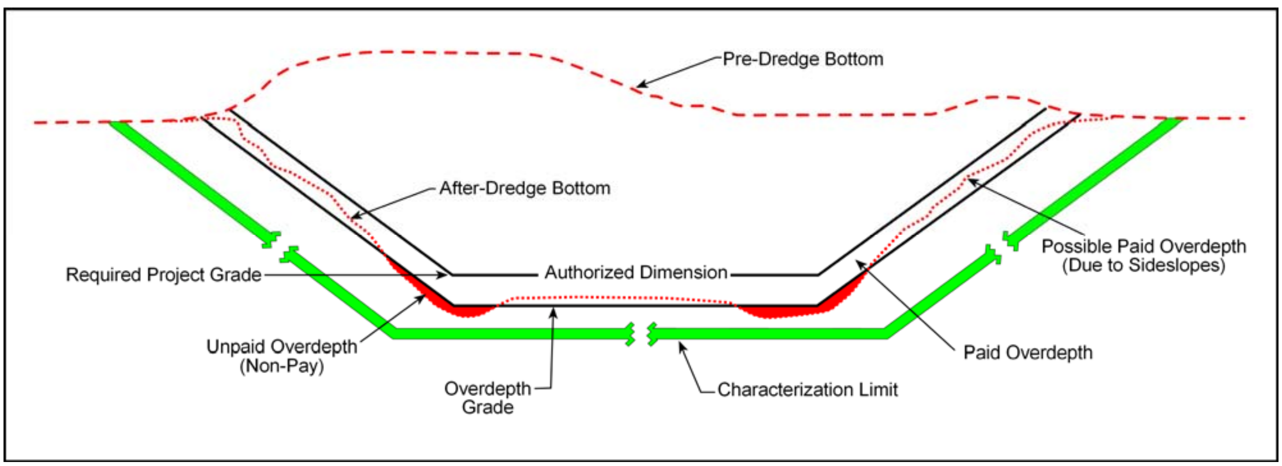


Figure 2.3-4 Various Dredging Prism Dimensions and Zones

As shown in Table 2.3-1, this required deepening to a maximum total project depth of -54 ft MLLW would involve the excavation of an estimated 5.2 million cy of dredged material. These volume estimates are based on 2006 bathymetry readings provided by USACE (see Appendix A.1) and account for deep portions of the channel where no deepening is necessary to achieve the total project depth of -52 ft or -54 ft MLLW. The estimated 5.2 million cy dredge volume will be used for planning purposes throughout the

FEIS. Of the 5.2 million cy total estimated volume, the -50 ft required project depth accounts for approximately 3.3 million cy, allowable overdepth from -50 to -52 ft MLLW accounts for approximately 1.3 million cy, and advance maintenance from -52 to -54 ft MLLW in those three fast-shoaling areas accounts for approximately 0.6 million cy. As discussed above, it is recognized that the dredging contractor may exceed the -54 ft MLLW total project depth occasionally, thus the dredged material characterization efforts discussed later in this document provide analysis of materials to a depth of -56 ft MLLW.

Table 2.3-1 Quantities of Dredged Materials for CVN Capable Alternatives

Dredge Site	**Volume of Dredged Material by Depth (million cubic yards)**			
	Project Depth (to -50 ft MLLW)	Allowable Overdepth (plus -2 ft MLLW)	Advance Maintenance (plus -2 ft MLLW)[2]	**TOTAL[1]**
Mayport Turning Basin (91 acres)	0.86	0.31	0	1.14
Mayport Entrance Channel (5,000 ft long by 500 ft wide)	0.58	0.30	0.27	1.15
Federal Navigation Channel (Station 196+00 to 185+00)	0.07	0.05	0.04	0.16
Federal Navigation Channel (Station 185+00 to 166+00)	0.06	0.06	0	0.12
Federal Navigation Channel (Station 166+00 to 138+00)	0.08	0.06	0	0.14
Federal Navigation Channel (Station 138+00 to 90+00)	1.22	0.32	0.3	1.84
Federal Navigation Channel (Station 90+00 to 0+00)	0.38	0.22	0	0.60
TOTAL	**3.3**	**1.3**	**0.6**	**5.2**

Note: [1]Dredged material volume estimates are provided in Appendix A-1. These values represent the estimated in-situ amount of material to be dredged taking into account 2006 bathymetry. A bulking factor of 1.2 will be applied for evaluating the volume of material to be disposed of.
[2]Advance maintenance would only occur in fast-shoaling areas of the dredge project.
[3] Column totals are rounded to provide more conservative estimate

Dredging Methods

The method of dredging could be a combination of mechanical and hydraulic dredging equipment that will be determined by the USACE and its dredging contractor. The dredging project could be implemented as early as 2011 and occur over the course of 12 to 18 months. Dredging operations typically occur continuously, up to 24 hours per day, seven days per week. The methods discussed below are those that lend themselves capable of placing sediment on the beach or within USEPA-managed ODMDS, as well as any bed leveling techniques used for smoothing of post-dredging bottom contours. Clamshell and hopper dredges are most typically used in the vicinity of Mayport, and larger cutter head equipment has also been used in the federal navigation channel for some projects. Limestone or bedrock is not expected in the dredging area, thus the use of blasting techniques are not anticipated. Because there are concerns for threatened or endangered species along the coastal areas of Florida, certain restrictions in dredge-related activities may apply throughout the course of the proposed dredging project (see Chapter 3.6 and 4.6 for more detailed information). The proposed 12-18 month schedule of continuous dredging accounts for such restrictions, although various types of dredging equipment may be required for certain seasons of the year to do so. The following sections discuss in detail the operating conditions of each dredging activity as well as the use of associated transportation equipment (i.e. tugs, scows, barges, etc.).

Hydraulic Dredges

Hydraulic dredges are characterized by their use of a centrifugal pump to dredge sediment and transport a slurry of dredged material and water to identified discharge areas. The ratio of water to sediment within the slurry mixture is controlled to maximize efficiency. The main types of hydraulic dredges are pipeline and hopper dredges.

Hydraulic Pipeline Dredges. Pipeline dredges are designed to handle a wide range of materials including clay, hardpan, silts, sands, gravel, and some types of rock formations without blasting. They are used for new work and maintenance in projects where suitable disposal areas are available and operate in an almost continuous dredging cycle resulting in maximum production, economy, and efficiency. Pipeline dredges are capable of dredging in shallow or deep water and have accurate bottom and side slope cutting. Limitations of pipeline dredges include relative lack of mobility, long mobilization and demobilization, inability to work in high wave action and currents, and impracticality in high traffic areas.

Pipeline dredges are rarely self-propelled, and therefore, must be transported to and from the dredge site. Pipeline dredge size is based on the inside diameter of the discharge pipe which commonly range from 6 inches to 36 inches. They require an extensive array of support equipment including pipeline (floating, shore, and submerged), boats (crew, work, survey), barges, and pipe handling equipment. Most pipeline dredges have a cutterhead on the suction end. A cutterhead is a mechanical device that has rotating teeth to break up or loosen the bottom material so that it can be sucked through the dredge. Some cutterheads are rugged enough to break up rock for removal (Figure 2.3-5).

During the dredging operation a cutterhead suction dredge is held in position by two spuds at the stern of the dredge, only one of which can be on the bottom while swinging. There are two swing anchors some distance from either side of the dredge, which are connected by wire rope to the swing wenches. The dredge swings to port and starboard alternately, passing the cutter through the bottom material until the proper depth is achieved.

Figure 2.3-5 Hydraulic Pipeline Dredge with Cutterhead

The dredge advances by "walking" itself forward on the spuds. This is accomplished by swinging the dredge to the port, using the port spud and appropriate distance, then the starboard spud is dropped and the port spud raised. The dredge is then swung an equal distance to the starboard and the port spud is dropped and the starboard spud raised.

Cutterhead pipeline dredges work best in large areas with deep shoals, where the cutterhead is buried in the bottom. A cutterhead removes dredged material through an intake pipe and then pushes it out the discharge pipeline directly into the disposal site. Most, but not all, pipeline dredging operations involve upland disposal of the dredged material. Therefore, the discharge end of the pipeline is connected to a shore pipe. When effective pumping distances to the disposal site become too long, a booster pump is added to the pipeline to increase the efficiency of the dredging operation (USACE 1993).

Hydraulic Hopper Dredges. The hopper dredge, or trailing suction dredge, is a self-propelled ocean-going vessel with a section of the hull compartmented into one or more hoppers. Fitted with powerful pumps, the dredges suck dredged material from the channel bottom through long intake pipes, called drag arms, and store it in the hoppers. Normal hopper dredge configuration has two drag arms, one on each side of the vessel. A drag arm is a pipe suspended over the side of the vessel with a suction opening called a draghead for contact with the bottom (Figure 2.3-6). Depending on the hopper dredge, a slurry of water and sediment is generated from the plowing of the draghead "teeth," the use of high pressure water jets, and the suction velocity of the pumps. The dredged slurry is distributed within the vessel's hopper allowing for solids to settle out and the water portion of the slurry to be discharged from the vessel during operations through its overflow system. When the hopper attains a full load, dredging stops and the ship travels to an in-water disposal site, where the dredged material is discharged through the bottom of the ship by splitting the hull. Some hopper dredges are capable of pumping the material back out of the vessel and through a series of shore-pipe to a designated disposal location.

Hopper dredges are well suited to dredging compacted heavy materials. They can maintain operations safely, effectively, and economically in relatively rough seas and because they are mobile, they can be used in high-traffic areas. They are often used at ocean entrances and offshore, but cannot be used in confined or shallow areas.

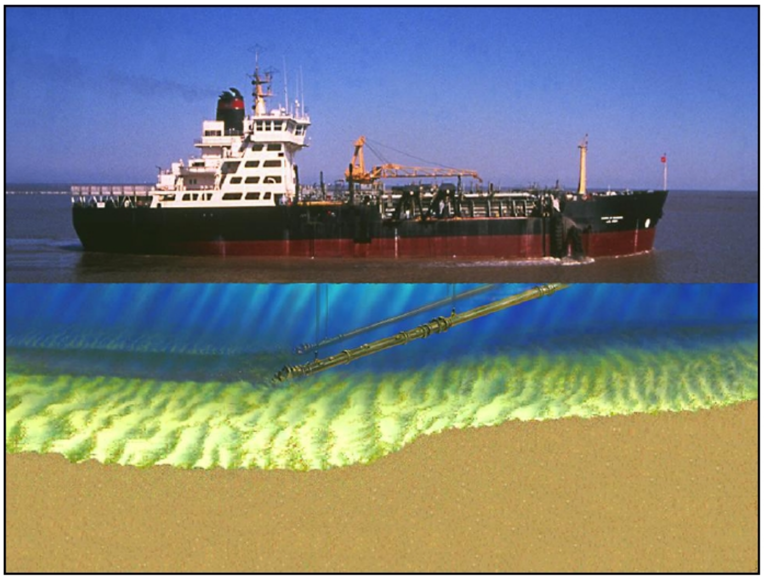


Figure 2.3-6 Hopper Dredge

Hopper dredges can move quickly to disposal sites under their own power (maximum unloaded speed of 16 knots; maximum loaded speed of 14 knots), but since the dredging stops during the transit to and from the disposal area, the operation loses efficiency if the haul distance is too far. Based on the review of hopper dredge speed data provided by the USACE Silent Inspector program, the average speed for hopper dredges while dredging is between 1 and 3 knots, with most dredges never exceeding 4 knots. Hopper dredges also have several limitations. Considering their normal operating conditions, hopper dredges cannot dredge continuously. The precision of hopper dredging is less than other types of dredges; therefore, they have difficulty dredging steep side banks and cannot effectively dredge around structures.

In order to minimize the risk of incidental takes of sea turtles, USACE requires the use of sea turtle deflecting dragheads on all hopper-dredging projects where the potential for sea turtle interactions exist. The leading edge of the deflector is designed to have a plowing effect of at least 6 inches depth when the drag head is being operated. Appropriate instrumentation is required on board the vessel to insure that the critical "approach angle" is attained in order to satisfy the 6-inch plowing depth requirement (USACE 1993).

Mechanical Dredges

Mechanical dredges are characterized by the use of some form of bucket to excavate and raise the bottom material (Figure 2.3-7). They remove material by scooping it from the bottom and then placing it onto a waiting barge or directly into a disposal area. Mechanical dredges work best in consolidated, or hard-packed, materials and can be used to clear rocks and debris. Dredging buckets have difficulty retaining loose, fine materials, which can be washed from the bucket as it is raised. Special buckets have been designed for controlling the flow of water and material from buckets and are used when dredging contaminated sediments. Mechanical dredges are rugged and can work in tightly confined areas. They are mounted on a large barge and are towed to the dredging site and secured in place by anchors or spuds. They are often used in harbors, around docks and piers, and in relatively protected channels, but are not suited for areas of high traffic or rough seas.

Figure 2.3-7 Clamshell (Bucket) Dredge

Dipper dredges and clamshell dredges, named for the scooping buckets they employ, are the two most common types. A bucket dredge begins the digging operation by dropping the bucket in an open position from a point above the sediment. The bucket falls through the water and penetrates into the bottom material. The sides of the bucket are then closed and material is sheared from the bottom and contained in the bucket compartment. The bucket is raised above the water surface, swung to a point over the barge, and then released into the barge by opening the sides of the bucket. Usually two or more disposal barges, called dump scows, are used in conjunction with the mechanical dredge. While one barge is being filled, another is being towed to the dumpsite by a tug and emptied. If a diked disposal area is used, the material must be unloaded using mechanical or hydraulic equipment. Using numerous barges, work can proceed continuously, only interrupted by changing dump scows or moving the dredge. This makes mechanical dredges particularly well suited for dredging projects where the disposal site is many miles away. The dipper dredge is essentially a power shovel mounted on a barge. It can dig hard materials and has all the advantages of the bucket dredge, except for its deep digging and sea state capabilities. Similar to the bucket dredge operation, the dipper dredge places material into a barge, which is towed to a disposal area (USACE 1993).

Bed Leveling

A "bed-leveler" is considered to be any type of dragged device used to smooth sediment bottom irregularities left by a dredge. It is also referred to as a "mechanical leveling device or drag bar". These bed-levelers are suspended from work-barges by winches on A-frames to control the operating depth of the device. A 1,000- to 3,000-horse power tug is generally used to push or pull the barge-mounted bed-leveler at towing speeds ranging from 1 to 2 knots. A typical bed-leveler varies from 30 to 50 ft in width and weighs anywhere from 25 to 50 tons. They are frequently used by dredge contractors following new work and maintenance dredging primarily to level out ridges and trenches created by dredging equipment or to reduce the height of dredged material disposal mounds that have reached an excessively high elevation. In certain cases, bed-levelers are used to redistribute sediments to maintain navigable depths rather than removing them by dredging with conventional methods. Dredge types using bed-levelers include clamshell (excavator), bucket, hydraulic cutterhead, and hopper dredges.

Bed-levelers are not a new dredging technique and can be documented as far back as 1565 (van de Graaf 1987). Typically, a bed-leveler consists of a large customized plow, I-beam, or old spud that is slowly dragged across the sediment to smooth out peaks and trenches during the final cleanup phase of the dredging activity. Another variant is for the hopper dredge to dig trenches along the channel below the project depth, and then a plow/I-beam bed-leveling device suspended from a barge is dragged along the bottom of the channel by a tugboat to knock material from high spots into deeper trenches dug along the channel bottom in order to achieve final project depth and an even grade. Additionally, bed leveling is considered as a form of agitation dredging. Bed-leveling has also been used by cutterhead dredge contractors for reducing heights of disposal mounds. According to hopper dredge, bucket dredge, and clamshell dredge contractors, bed-leveling is the preferred and least expensive method for achieving the final grade as compared to re-dredging (ERDC 2003). A barge and workboat performing bed-leveling by trailing where a hopper dredge has been excavating is a relatively inconspicuous activity (ERDC 2003).

Transportation Activities – Hopper Dredges, Tugs and Scows/Barges

Depending on the dredging and disposal site conditions for an individual project, as a component of hydraulic and mechanical dredging operations, accompanying equipment such as tugs and barges may be used in association with dredging activity in order to transport the dredged material to a pre-determined disposal site. Methods of transporting dredged material to disposal sites include self propelled transport via hopper dredges or towing of loaded barges to disposal sites via tugboats. Tugboats are a component of all dredging operations and may be used to move immobile equipment into place as well as towing loaded barges to the disposal sites. Hopper dredges or bucket and barge operations are often used when disposal areas are beyond the pumping distance of pipeline dredges considering that hopper dredges and barges can transport material over long distances to the disposal sites. Depending on a myriad of factors such as the type of dredged material, cubic yardage to be dredged, barge capacity, overflow capability, distance of disposal site, weather, etc., there may be several hopper dredges or barges that consistently rotate from the dredge site to the disposal site to achieve maximum efficiency and productivity. The number of hopper loads or barges towed, the transport interval, and the speed to the disposal site will vary for each project depending on these factors. As discussed previously, hopper dredges typically dredge at 1 to 3 knots and have a maximum unloaded speed of 16 knots (maximum loaded speed of 14 knots). Based on recent USACE Silent Inspector data, barges and scows are towed at average speeds between 5 and 8 knots and exceed 10 knots approximately 10 percent of the time.

Maintenance Dredging

Following the construction dredging, there would be long-term dredge maintenance requirements to maintain the increased depth created by the construction dredge project. The Navy currently removes approximately 900,000 cy from the NAVSTA Mayport turning basin and entrance channel every two years as part of its maintenance dredging program (annual average of 450,000 cy). Most of this material historically has been disposed of in the Jacksonville ODMDS, but portions also have been placed upland in the past, as appropriate. The USACE also currently removes approximately 300,000 cy from the outer portion of the federal navigation channel during maintenance dredging every three years (annual average 100,000 cy) which has been disposed of in the Jacksonville ODMDS since 2003. Due to increased depth, maintenance dredging requirements would be expected to increase. Sediment transport modeling to predict future maintenance dredge requirements indicated an increase of about 2 percent, 7 percent, and 2 percent in sedimentation within the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigation channel, respectively (Appendix A.5). This equates to an approximate 5 percent increase of overall maintenance volume for the project, or an annual increase of approximately 27,500 cy of maintenance material.

2.3.1.2 Dredged Material Disposal

Options for dredged material disposal depend on several factors, including availability of approved placement sites and the quantity, grain size, and chemical characteristics of the sediment to be dredged. The Navy would dispose of the dredged material from the proposed deepening project in the ocean in USEPA-managed ODMDSs as it does for its periodic maintenance dredging projects. [Note that the DEIS estimated a dredge material volume of 5.7 million cy. However based on hydrodynamic model results, it was determined that certain sections of the project would not require advance maintenance, which reduced the estimated dredge volume from 5.7 million cy to 5.2 million cy.] The Navy evaluated the feasibility of utilizing existing or potential new upland dredged material disposal sites and concluded that there was no viable upland disposal option for the volume of dredged material (5.2 million cy) envisioned in the proposed deepening project (see Upland Disposal subsection, below). As a consequence, ocean disposal is the most suitable means of disposal. As part of the DEIS, the Navy conducted a preliminary sampling and testing program to assess physical and chemical characteristics of the approximately 5.2 million cy of sediment to be dredged. Additional chemical and biological testing of sediments was completed by USACE after publication of the DEIS specifically to build on the initial sediment characterization test results reflecting suitability for ocean disposal and to satisfy the full spectrum of testing requirements of the Marine Protection, Research, and Sanctuaries Act (MPRSA) of 1972, Section 103 Evaluation. The results of this additional round of sediment testing for the Section 103 Evaluation are presented in Section 3.1.5 of this FEIS and indicate that more than 4.8 million cy of the material meets the USEPA Section 103 suitability criteria for ocean disposal. One of eight zones established for sediment sampling for the proposed project failed slightly the bioassay portion of the Section 103 testing. This zone represents approximately 315,000 cy of the total 5.2 million cy project. As the test results were very close to passing the criteria (test results were 70 percent survival rate, but 71 percent survival rate is needed for a passing test), this zone of the proposed dredging area is being re-tested for the bioassay portion of the Section 103 requirements. In the event that this failed bioassay is confirmed with another failing test, the volume of dredged material would be placed at existing permitted upland disposal sites in the vicinity of NAVSTA Mayport. The Section 103 Evaluation was initiated prior to the issuance of the FEIS and will be finalized as part of the project permitting process. Ocean disposal, upland disposal, and beach nourishment are discussed in more detail below.

<u>Ocean Disposal</u>

Disposal of dredged material would occur at the USEPA-managed Jacksonville ODMDS and Fernandina ODMDS. The Jacksonville and Fernandina ODMDSs are the two nearest ocean disposal sites designated by the USEPA and managed/monitored by the USEPA and USACE pursuant to the MPRSA. The suitability of dredged material for ocean disposal in the Jacksonville ODMDS or Fernandina ODMDS must be verified by the USACE and endorsed by the USEPA prior to ocean disposal. Documentation of verification must be completed prior to use of the ODMDS and is being performed as part of the MPRSA Section 103 Evaluation. The Section 103 Evaluation was initiated prior to the issuance of the FEIS and will be finalized as part of the project permitting process. The evaluation and required testing followed the procedures outlined in the 1991 USEPA/USACE *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, commonly referred to as the "Green Book" and 1993 Regional Implementation Manual (USEPA and USACE 1993). Only material determined suitable through this verification process by USACE and USEPA Region 4 would be placed at the Jacksonville or Fernandina ODMDS. The results of this additional round of sediment testing for the Section 103 Evaluation (presented in Section 3.1.5 of this FEIS) conclude at least 4.8 million cy of material meet the USEPA Section 103 suitability criteria for ocean disposal. It is expected that the remaining approximately 315,000 cy of the 5.2 million cy total will also be suitable for ocean disposal, pending the results of the retesting.

The Jacksonville ODMDS is located 5.5 nautical miles (nm) southeast of the NAVSTA Mayport turning basin and has been in use since 1952 (see Figure 2.3-1). NAVSTA Mayport has used the ODMDS regularly since 1954 and has been taking all of its maintenance dredged material to the Jacksonville ODMDS since two upland dredged material placement sites on NAVSTA Mayport reached capacity in 1993. During the 13 year period from 1996 to 2008, the Federal Navigation Project was permitted to dispose of approximately 1.1 million cy of maintenance dredged material and the Navy was permitted to dispose of approximately 4.9 million cy of maintenance dredged material in the Jacksonville ODMDS, equating to an overall annual average disposal of 460,000 cy over that period of time (see Section 4.1.4.2). The Jacksonville ODMDS is one nm by one nm in size. Based on a June 2007 bathymetric survey performed by USACE, the average water depth in the ODMDS is -46 ft, with depths ranging from -35 ft to -55 ft. The USACE has developed a Site Management and Monitoring Plan (SMMP) to specifically address the placement of dredged material at the Jacksonville ODMDS (USEPA and USACE 2007). The existing SMMP for the Jacksonville ODMDS identifies a restriction on the annual volume of dredged material that can be placed there (2 million cy).

The Fernandina ODMDS was designated by USEPA in March 1987. The Fernandina ODMDS covers an area of about four square nm (two nm by two nm) at a site located about 8.5 nm northeast of the NAVSTA Mayport turning basin and 5.5 nm east of Nassau Sound (see Figure 2.3-1). Based on a June 2007 bathymetric survey performed by USACE, depths range from -40 to -67 ft MLLW. The USACE has projected disposal in the ODMDS on the average of 600,000 cy of dredged material every year from maintenance of the Submarine Base Kings Bay Entrance Channel. (An average of 350,000 cy every three years from maintenance of the Submarine Base Inner Channel and Turning Basin also is placed at an upland disposal site.) Additional potential projects that could utilize the Fernandina ODMDS include the Fernandina Port Authority, Fernandina City Marina, or private dredging projects that secure appropriate State and Federal approvals (USEPA and USACE 1998, 2001). The existing SMMP for the Fernandina ODMDS identifies a requirement to perform modeling for proposed projects exceeding 950,000 cy to determine an appropriate buffer to contain the initial disposal mound within the ODMDS boundaries.

In the DEIS, the Navy evaluated the physical capacity of both ODMDSs using simple geometric measurement of the latest bathymetric survey compared with management restrictions for use of the site (Appendix A.2). These calculations yield minimum capacity estimates of approximately 9.3 million cy and 64.8 million cy at the Jacksonville and Fernandina ODMDSs, respectively. The Navy also simulated the placement of dredged material in each ODMDS using the Multiple Dump Fate (MDFATE) computer model to determine if an estimated 5.7 million cy (original volume estimated in the DEIS) of material to be dredged would fit within the boundaries of each ODMDS (Appendix A.2). The MDFATE modeling confirmed that the in-situ volume of 5.7 million cy would fit within each ODMDS, thus the Navy has two viable ocean disposal sites for the proposed dredging project, which currently proposes a dredge volume of only 5.2 million cy.

In the DEIS, the Navy recommended that proposed project dredged material volume be split between the two ODMDSs so the available capacity at Jacksonville ODMDS would not be adversely affected. The Jacksonville SMMP (USEPA and USACE 2007) includes the historical use of the ODMDS. From the 11-year period of 1996 to 2006, approximately 4.8 million cy of dredged material was permitted for placement at Jacksonville ODMDS. This represents an average of approximately 440,000 cy per year. When considering two additional recent disposal events at the ODMDS that occurred in 2007 (approximately 510,000 cy for the Federal Navigation Project) and 2008 (approximately 635,000 cy for the NAVSTA Mayport turning basin and entrance channel), the average disposal volume increases to approximately 460,000 cy per year over that 13 year period. If all 5.2 million cy of the proposed dredging project were disposed of in the Jacksonville ODMDS along with the projected 4.6 million cy projected over the next 10 years (460,000 cy per year for 10 years), capacity of the ODMDS would be exceeded (see Section 4.1.4.2). As a result, the Navy proposes to dispose of portions of the 5.2 million cy of dredged material in each ODMDS, including placement of 2 million cy in Jacksonville ODMDS and the remaining 3.2 million cy in Fernandina ODMDS.

Since the publication of the DEIS, the USACE in association with USEPA has prepared an updated assessment of available capacity of the Jacksonville ODMDS to accept dredged material. Their May

2008 Draft report entitled: *Jacksonville Ocean Dredged Material Disposal Site Capacity Report*, is contained in Appendix A.6 of this Final EIS.

The Jacksonville ODMDS capacity report was prepared following the collection of one year of wave and current data at the site. Recent bathymetric surveys were taken and used as a baseline to estimate available remaining space within the ODMDS pursuant to site management criteria that maintains the site so that is does not pose a navigational hazard; that dredged material does not accumulate outside of the disposal site boundaries; and that maximum utilization of the site's capacity is attained. The latest bathymetry of the site indicates that elevation along the site boundary ranges from -46 ft to -57 ft MLLW while elevation of the center of the site is at or near -30 ft MLLW. Dredge material disposal contractors are now directed away from the center portion of the ODMDS to avoid breaching minimum depth criteria of -25 ft MLLW identified in the SMMP. Also, the center portion of the site was not included in the capacity analysis, as it is considered "full" for planning purposes.

The USACE capacity report used the MDFATE model that was also used by the Navy in its analyses published in the DEIS. The capacity assessment assumed a disposal volume of 2 million cy (new work) from the proposed NAVSTA Mayport deepening project and 800,000 cy of annual maintenance dredging. (The USACE projection of 800,000 cy per year for future maintenance dredging is greater than the historical annual average of 460,000 cy [see Section 4.1.4.2] and provides a conservative estimate that includes possible use of the ODMDS for additional Federal Navigation Project material disposal.) The types (silt, clay, and sand) of dredged sediment were estimated using data collected by the Navy for the proposed NAVSTA Mayport deepening project, and from historical records on maintenance sediment from the NAVSTA Mayport turning basin and entrance channel and federal navigation channel.

The conclusions of this draft USACE Capacity draft report confirm that the Jacksonville ODMDS can accommodate the 2 million cy of new work from the proposed deepening of the Mayport project. The remaining ODMDS capacity would allow 8 to 10 years or 6.4 million cy to 8.0 million cy of additional maintenance (in-situ or in-place) without violating the SMMP criteria. The draft report also indicates that the MDFATE analysis is being followed by additional modeling (Long Term FATE) of the Jacksonville ODMDS. This latter modeling estimates the amount of dispersion and/or disposition potential of dredged material after disposal and over time at the site. Historical records of dredged material and disposal at Jacksonville ODMDS indicate that portions of the disposed material (particularly silt) do not remain at the site, but are dispersed by waves and currents. Therefore, capacity estimates provided in this draft report may be considered conservative as the Long Term FATE model runs may show more available capacity and the estimate stated above represents a practical minimum estimate of capacity.

Upland Disposal

The feasibility of using existing sites or establishing new sites for upland disposal in the vicinity of NAVSTA Mayport has been evaluated. The USACE previously performed a comprehensive evaluation of potential upland disposal sites for Navy use in 1994 (USACE 1994a) and the Navy updated the analysis as part of this EIS. Table 2.3-2 identifies the status of existing upland disposal sites and Figure 2.3-8 shows undeveloped land parcels that potentially could be acquired for use for upland disposal. For this EIS, a screening analysis of 2,800 locations within 10 miles of NAVSTA Mayport was conducted (10 miles is the maximum practical length of hydraulic pipeline dredge). The existing dredged material disposal sites that are located within a 10-mile radius of NAVSTA Mayport have committed capacity for use in receiving dredged material from other USACE maintenance dredging projects and Jacksonville Port users. These existing dredge disposal sites are not available for use by the Navy for the large volume NAVSTA Mayport deepening project, but would be able to accommodate smaller amounts.

Two undeveloped parcels evaluated met all of the size, and other physical characteristics to become a new dredge material disposal site for use in this project. However, both sites are currently owned by the National Parks Service and are located within the Timucuan Ecological and Historic Preserve. Land use changes for the long term use as a dredge material disposal site are not considered feasible or desirable within the Timucuan Ecological and Historic Preserve. An existing conservation easement at site 99 specifically precludes any deposition of soils at that site. Additionally, even when excluding land purchase and related costs, estimates for site preparation and disposal exceed cost estimates for ocean disposal. Therefore, it is concluded that use of the Jacksonville or Fernandina ODMDSs in the vicinity of NAVSTA Mayport is the most suitable means for the placement of the dredge material from the proposed deepening project. However, existing permitted upland disposal sites are available for disposal of minimal amounts of dredge material should any material not be verified by USEPA Region 4 as suitable for ocean disposal. If the approximately 315,000 cy of dredge material currently being retested for the bioassay portion of the USEPA Section 103 suitability criteria is confirmed a failure, that volume would be placed in an existing permitted upland disposal site.

Existing permitted upland sites in the vicinity are Buck Island and Fanning Island. The 315,000 cy of material currently being retested for ocean disposal suitability is generally compatible in physical and chemical characteristics (fine grained quartz sand with some clay and silt) to materials that can be placed at Buck Island. Fanning Island (Florida Inland Navigation Site DU-6) has not been previously used for dredged material disposal, however, due to the high sand component and lack of contamination found in the samples collected from the 315,000 cy volume, it should be suitable for placement into the upland

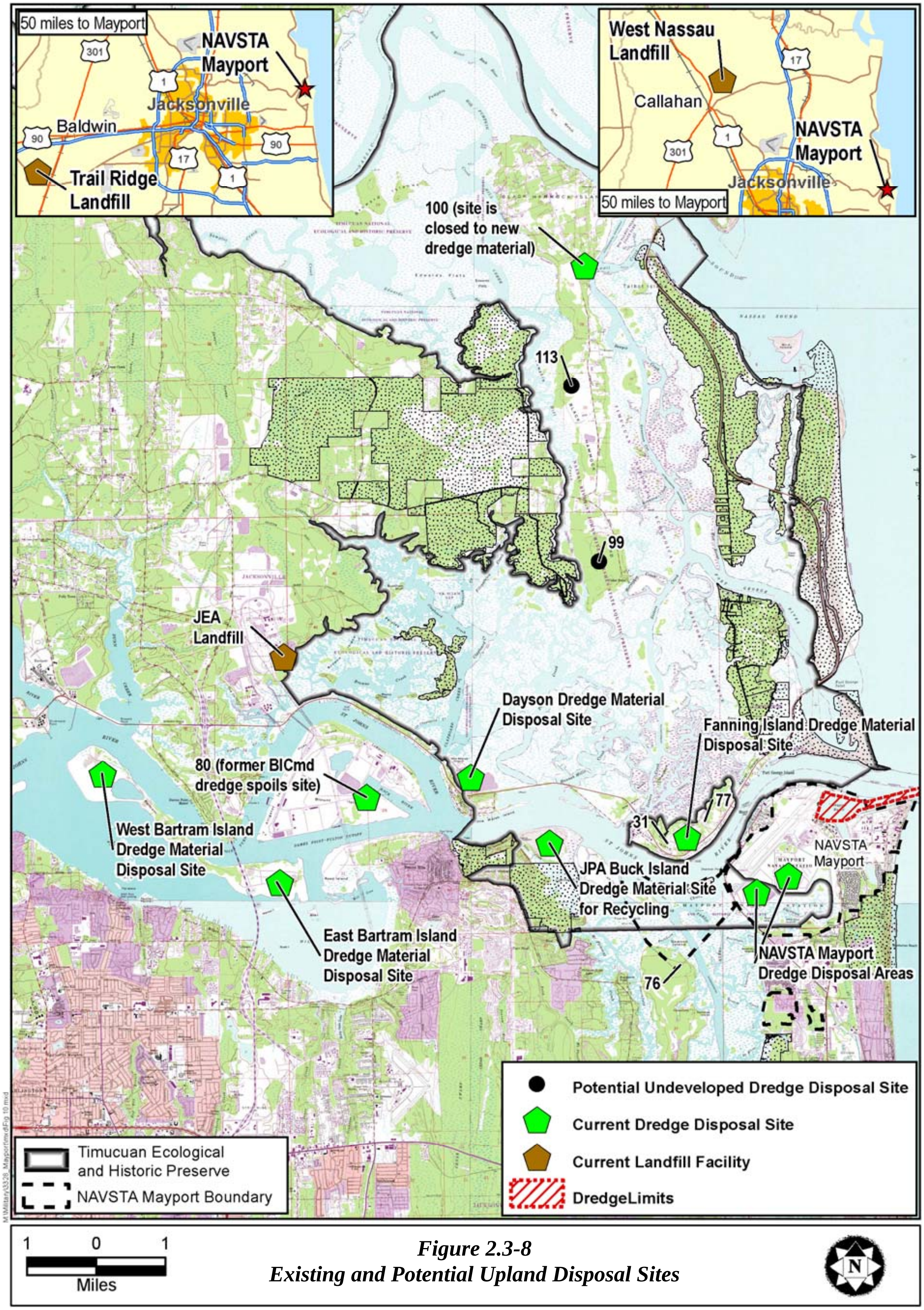


Figure 2.3-8
Existing and Potential Upland Disposal Sites

Table 2.3-2 Upland Dredge Disposal Sites

Site	Current Capacity	Availability	Dewatering Required	Mode of Transport
NAVSTA Mayport Dredge Disposal Sites	At capacity, but work underway to evaluate feasibility of reuse options	Not available, at capacity	At disposal site	Hydraulic pump
East Bartram Island	1,648,000 cy	Not available for full 5.2 million cy volume, supports federal maintenance requirements, Navy use requires coordination and approval	At disposal site	Hydraulic pump/barge
West Bartram Island	3,282,000 cy	Not available for full 5.2 million cy volume, supports federal maintenance requirements, Navy use requires coordination and approval	At disposal site	Hydraulic pump/barge
Jacksonville Port Authority Buck Island	1,622,800 cy, but fluctuates as material is used for construction fill	Not available for full 5.2 million cy volume, supports federal maintenance requirements, Navy use requires coordination and approval	At disposal site	Hydraulic pump/barge
Marine Corps Dayson Site	Supports dredging of the slipway in support of Maritime Prepositioning Force Program	Not available, capacity committed to slipway maintenance	At disposal site	Barge
Fanning Island	730,000 cy/day	Temporary only, not available for full 5.2 million cy volume, Navy use requires coordination and approval	No	Hydraulic pump
Jacksonville Electric Authority Site	Not applicable	Used for mixing dredged material with bed ash (energy by product) for stabilization prior to upland disposal elsewhere	Yes	Hydraulic pump/barge
West Nassau Landfill	3,000 cy/day for 12 years	Requires approval by landfill director, City of Jacksonville and Florida Dept. of Environmental Protection	Yes	Truck
Trail Ridge Landfill	3,000 cy/day for 14 years	Requires approval by landfill director, City of Jacksonville and Florida Dept. of Environmental Protection	Yes	Truck

sites and be available for further consideration for offloading from the sites for beneficial use in the future (Ross 2008c). Any use of an upland disposal site would be coordinated and approved during the project permitting process.

Beneficial Use

Beneficial uses of dredged material typically include beach nourishment; artificial reef creation/enhancement (for any dredged rock materials); habitat creation; construction; and remediation cover, depending upon the characteristics of the dredged material. Because no limestone or other rock is expected in the dredge area, artificial reef creation/enhancement is not a likely beneficial use of the project dredge material. There is a strong need, however, for dredged material for local beach nourishment. Several beaches in Duval County have been regular recipients of sand for beach nourishment and shoreline stabilization projects and are potential recipients of dredged material from the St. Johns River. These include the approximately 16-mile stretch of beaches located south of the south jetty at the St. Johns River entrance and include the beaches of NAVSTA Mayport, Kathryn Abbey Hannah Park, Atlantic Beach, Neptune Beach, and Jacksonville Beach (see Figures 1.1-1 and 1.1-2). Beach nourishment on these beaches has occurred since 1963 and has included beach quality sand periodically dredged from the Jacksonville Harbor as well as sand mined from two borrow areas located approximately seven miles offshore from Atlantic Beach (Florida Department of Environmental Protection [FDEP] 2000a). Sand volumes from Jacksonville Harbor maintenance dredging are placed south of the south jetty using a hydraulic dredged material discharge pipeline that carries slurry material from the dredging site to the beaches. For the larger beach nourishment projects involving sand mining offshore, sand is pumped to a hopper or barge, transported close to the replenishment site, and pumped to the site through a pipeline from the hopper or specially designed barge. In both cases, heavy equipment (e.g., bulldozers) is used to distribute the sand along the shoreline after the material has been piped on shore. Operations proceed on a 24-hour basis, seven days a week, weather permitting. Affected sections of the beach are temporarily closed to public access while sediment is being piped in and heavy equipment is being used to distribute the sediment.

Sand used for nourishment activity must meet the requirements of the Florida Sand Rule (Florida Administrative Code [FAC] Section 62B-41.007), which states, "only beach compatible fill shall be placed on the beach or in any associated dune system." Beach compatible fill is defined as "material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system." The definition of beach compatible fill addresses composition, particle size, color, and grain size distribution (sand grain frequency, mean and median grain size, and sorting coefficient) of the material in the existing coastal system at the placement site. Between 1963 and 1999, there have been at least 15 nourishment projects on nearby Duval County beaches. Since then, there has been only one (occurring between 2003 and 2005), largely due to the lack of beach compatible material found within channel-dredged sediments. Materials dredged from upper reaches of the St. Johns

River have been found to be compatible with Duval County beaches in the past, but materials dredged from the NAVSTA Mayport turning basin and entrance channel have not been used for beach nourishment projects in the past.

As part of the DEIS, the Navy conducted geotechnical borings and sub-bottom profiling to identify the likelihood of beach compatible sand present in the material to be dredged. Preliminary geotechnical sampling and analysis of the sediments within the dredge footprint (including turning basin, entrance channel, and federal navigation channel) was completed and identified limited presence of sand layers in some borings, but the expanse of the sand could not be determined by the relatively few number of sediment samples (Appendix A.3). The sub-bottom profiling investigation identified sand layers in the NAVSTA Mayport entrance channel (110,000 cy) and in the federal navigation channel Bar Cut 3 Area 1 (115,000 cy) that appeared to be thick enough for further consideration as potential beach-compatible sand (Appendix A.4). However, the sediment borings and the subsurface imagery suggested vertical and horizontal variability in the sediment quality. This variability and layered nature of the sand creates the need for selective excavation, sometimes requiring specific dredge equipment or sediment separation techniques. Therefore the approximately 225,000 cy of identified sand layers represents the maximum amount of potential beach compatible sand, and further sampling and testing would be necessary to determine whether the sand meets the requirements of the Florida Sand Rule (FAC 62B-41.007) and could feasibly be used for beach nourishment.

While beach nourishment was considered by the Navy in the DEIS as a possible dredge material disposal option, further testing conducted as part of the FEIS has led the Navy to eliminate such beneficial reuse from further consideration in this FEIS. Since publication of the DEIS, USACE conducted additional vibracore sampling in the locations potentially containing thicker sand layers in the outer NAVSTA Mayport entrance channel and the federal navigation channel. Their results confirmed the layered nature of the sediments in these areas and concluded that material dredged from this area would not meet beach-quality standards for a beach construction project due to unacceptable percentages of fine sediments in the sand layers. USACE also determined that it was not feasible to separate the limited beach quality sand layers from non-beach quality material due to costs associated with mobilizing multiple pieces of dredging equipment, lack of precision in targeted dredging operations, as well as potential for encountering additional layers of silt or clay previously not detected.

Material from the area to be dredged also is not acceptable for nearshore placement, as the criteria set forth in FAC 62B-41.007.5(k) and 62B-41.005 apply to channel maintenance projects rather than channel construction projects as proposed by the Navy. Additionally, no nearshore placement area has been previously designated in Duval County, and designation of a new nearshore placement area is not

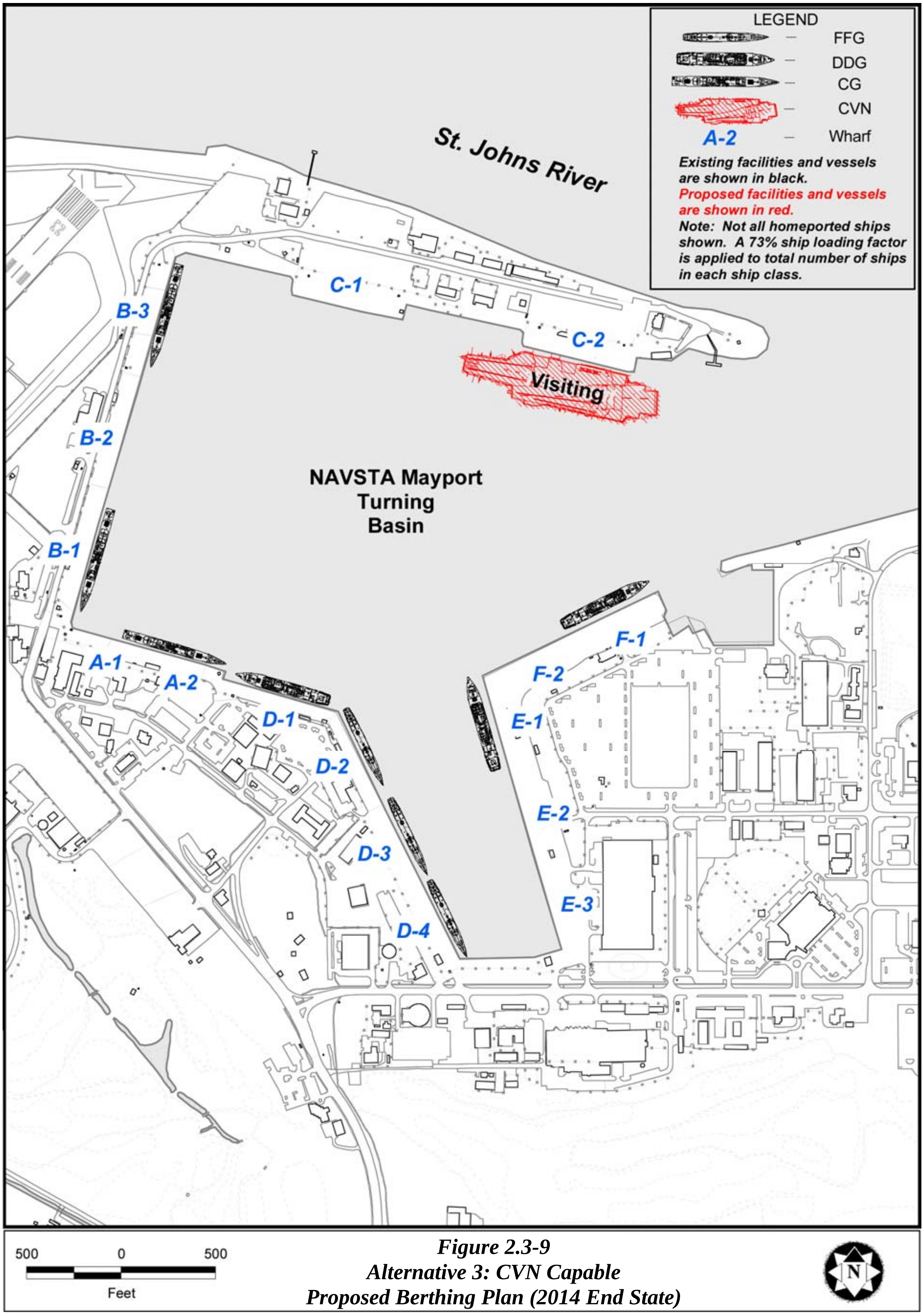


Figure 2.3-9
Alternative 3: CVN Capable
Proposed Berthing Plan (2014 End State)

considered practicable in this FEIS. Designation of a nearshore placement area would require substantial additional NEPA analysis, including necessary surveys (e.g., of bathymetry, cultural resources, biological resources) and agency coordination. These factors, along with the Navy's need to proceed with decision making regarding homeporting of additional surface ships at NAVSTA Mayport on a reasonable timeline, preclude the feasibility of nearshore placement for the proposed dredge project. Therefore, beach nourishment and/or nearshore placement are not considered further in this FEIS.

2.3.2 ALTERNATIVE 3: CVN CAPABLE

As a CVN would not be homeported under this alternative, no additional personnel would be assigned to NAVSTA Mayport (see Table 2.1-1). As shown below in Table 2.3-3, there would be a net loss of approximately 3,900 in the net daily population at NAVSTA Mayport between the 2006 baseline year and the 2014 end state year. The CVN could begin visiting NAVSTA Mayport without restrictions as early as 2012. When the CVN visits, the ship's crew of 3,140 would temporarily increase the population of NAVSTA Mayport. For the purposes of this EIS, it is estimated that the CVN would visit NAVSTA Mayport for up to 63 days per year, with no single visit lasting greater than 21 days (approximately 3 visits per year). By 2014, the number of ships homeported at NAVSTA Mayport would be 11 due to decommissioning KENNEDY in 2007 and 10 FFGs by 2014. Dredging would occur as described in Section 2.3.1. Figure 2.3-9 depicts the proposed berthing plan for Alternative 3.

Table 2.3-3 Alternative 3 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State[7]**
Nondeploying Population	6,210	5,671	5,671	5,671	5,671	5,671	5,671
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	0	0	0	0	0	0
Ships Maintenance Personnel[3]	1,504	965	965	965	965	965	965
Ships Personnel in Port[4]	6,036	4,213	4,056	4,056	3,585	3,114	2,643
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**10,910**	**10,753**	**10,753**	**10,282**	**9,811**	**9,340**
Number of Ships Homeported	**22**	**21**	**20**	**20**	**17**	**14**	**11**

Notes: See Table 2.1-2 notes

2.3.3 ALTERNATIVE 7: CRU/DES HOMEPORTING AND CVN CAPABLE

Alternative 7 combines Alternatives 1 and 3 CRU/DES homeporting and CVN capable options. Additional DESRON staff and a total of five additional ships (four DDGs and one FFG) would be homeported at NAVSTA Mayport. The five ships could arrive for homeporting as early as 2009, but it

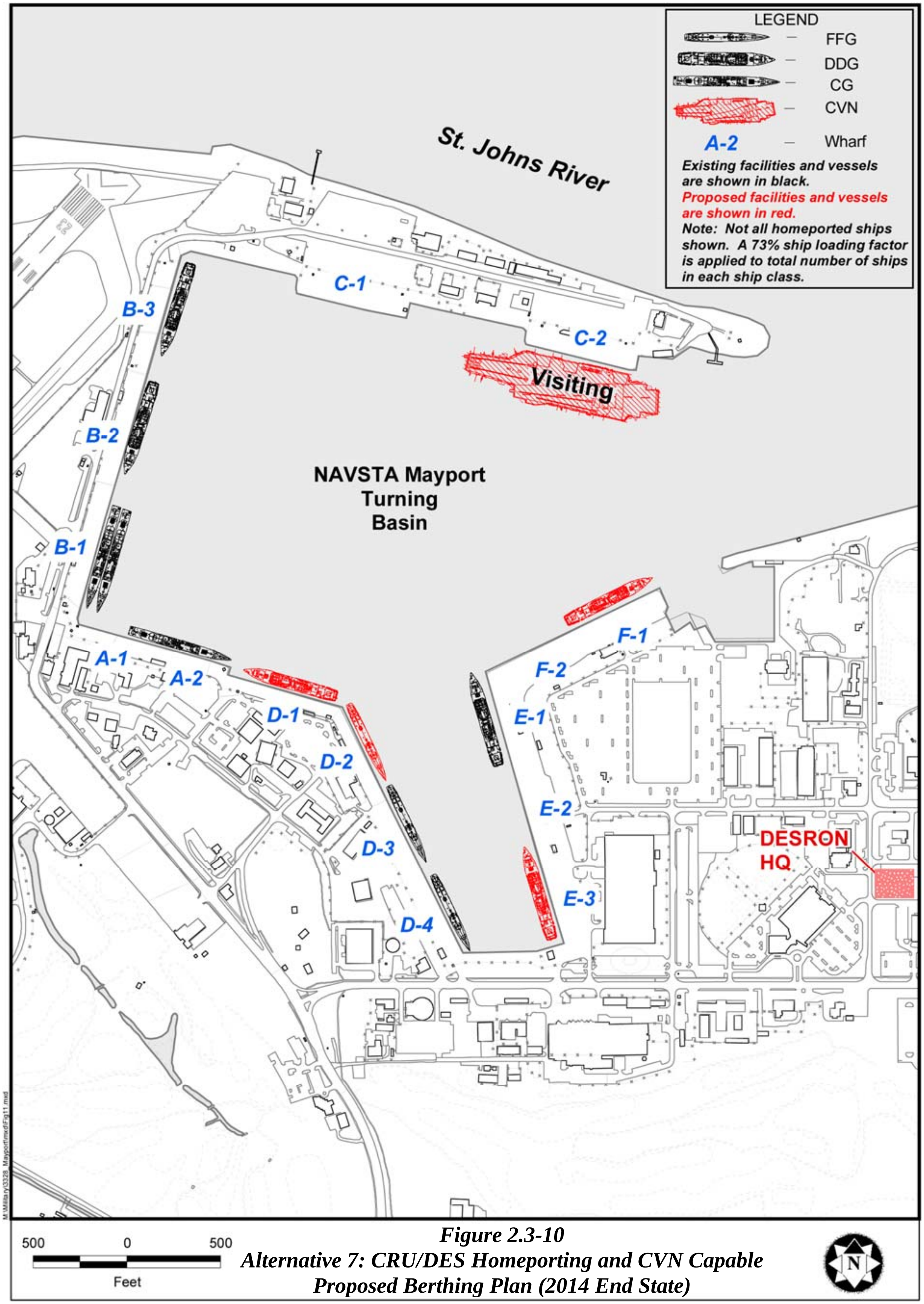


Figure 2.3-10
Alternative 7: CRU/DES Homeporting and CVN Capable Proposed Berthing Plan (2014 End State)

should be noted that the proposed FFG also could be decommissioned as early as 2014. The total estimated gain in personnel stationed at NAVSTA Mayport from Alternative 7 would be approximately 1,800 personnel (the same as Alternative 1, see Table 2.1-1). As shown in Table 2.3-4, the net daily population would decrease by approximately 2,800 between the baseline and 2014. The gain in personnel from the five additional ships would partially offset the losses associated with decommissioning KENNEDY in 2007, decommissioning 10 of the current FFGs between 2010 and 2014, decommissioning of the proposed FFG as early as 2014, and SERMC military personnel downsizing between 2006 and 2009. The number of ships homeported at NAVSTA Mayport in 2014 would be 15.

As with the other alternatives including CRU/DES Homeporting, a new DESRON headquarters building would be required under Alternative 7. Size and location of this facility would be the same as described for Alternative 1, as depicted in Figure 2.3-10 along with the berthing plan for Alternative 7. Dredging would occur as described in Section 2.3.1.

Table 2.3-4 Alternative 7 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State[7]**
Nondeploying Population	6,210	5,726	5,726	5,726	5,726	5,726	5,726
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	35	35	35	35	35	35
Ships Maintenance Personnel[3]	1,504	985	985	985	985	985	985
Ships Personnel in Port[4]	6,036	5,479	5,322	5,322	4,852	4,381	3,753
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,231**	**12,074**	**12,074**	**11,603**	**11,133**	**10,505**
Number of Ships Homeported[8]	**22**	**26**	**25**	**25**	**22**	**19**	**15**

Notes: See Table 2.1-2 notes

2.3.4 ALTERNATIVE 9: LHD HOMEPORTING AND CVN CAPABLE

Alternative 9 combines Alternatives 2 and 3 homeporting and CVN capable options. A total of two additional ships (two LHDs) would be homeported at NAVSTA Mayport. Personnel gain under this alternative would be approximately 2,200, the same as described for Alternative 2 (see Table 2.1-1). As shown below in Table 2.3-5, the net daily population at NAVSTA Mayport would decrease by approximately 2,300 between the baseline and 2014. Personnel gains due to homeporting of LHDs would somewhat offset the losses due to decommissioning KENNEDY in 2007, decommissioning 10 FFGs between 2010 and 2014, and SERMC military personnel downsizing between 2006 and 2009. By 2014, the number of ships homeported at NAVSTA Mayport would be 13. Dredging would occur as described in Section 2.3.1. The proposed berthing plan for Alternative 9 is provided in Figure 2.3-11.

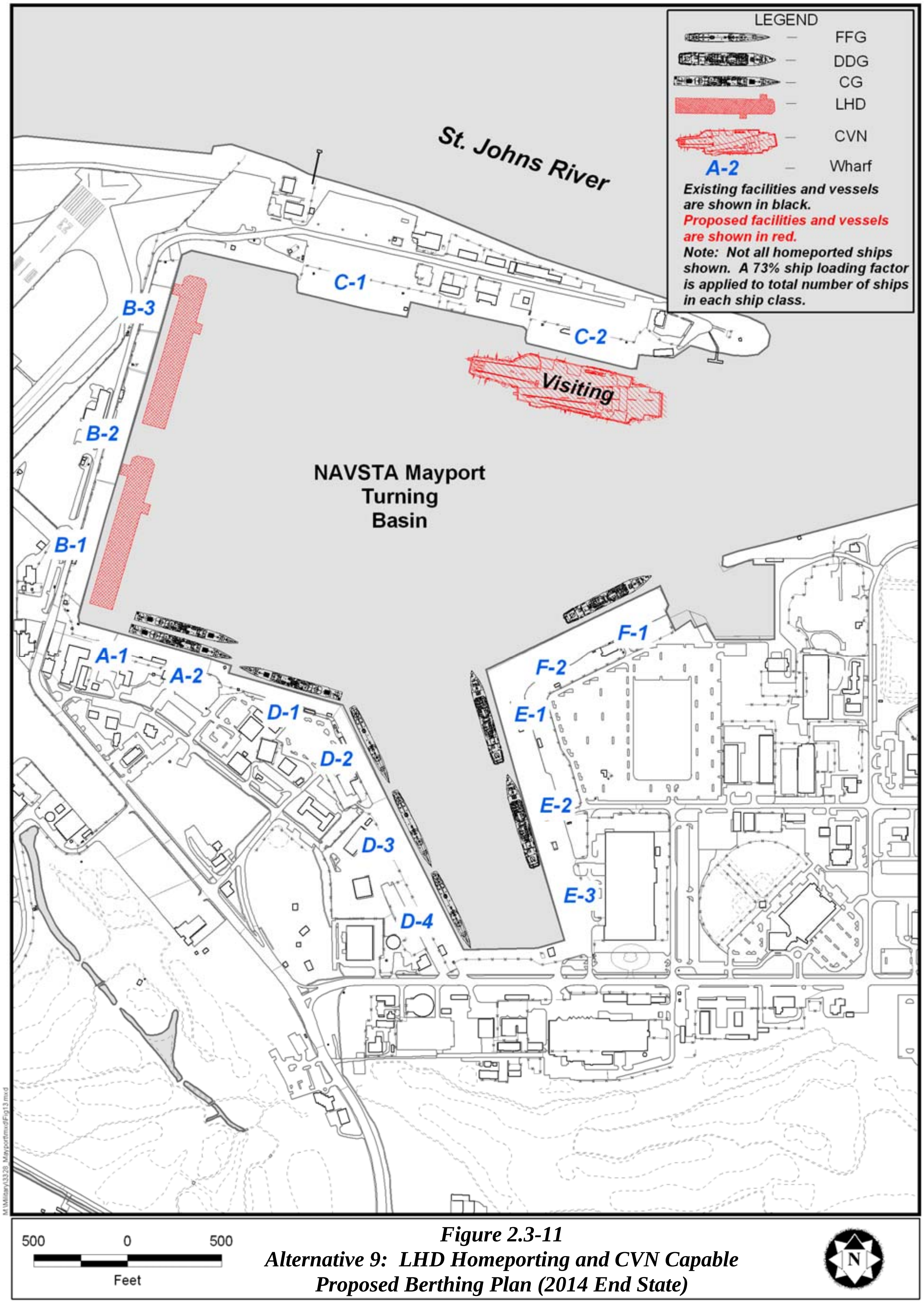


Figure 2.3-11
Alternative 9: LHD Homeporting and CVN Capable Proposed Berthing Plan (2014 End State)

Table 2.3-5 Alternative 9 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	2009	2010	2011	2012	2013	2014 End State[7]
Nondeploying Population	6,210	5,686	5,686	5,686	5,686	5,686	5,686
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	5	5	5	5	5	5
Ships Maintenance Personnel[3]	1,504	975	975	975	975	975	975
Ships Personnel in Port[4]	6,036	5,793	5,636	5,636	5,165	4,694	4,223
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,504**	**12,347**	**12,347**	**11,877**	**11,406**	**10,935**
Number of Ships Homeported	**22**	**23**	**22**	**22**	**19**	**16**	**13**

Notes: See Table 2.1-2 notes

2.3.5 ALTERNATIVE 11: CRU/DES HOMEPORTING AND LHD HOMEPORTING AND CVN CAPABLE

Alternative 11 combines Alternatives 1, 2, and 3 homeporting and CVN capable options. A total of seven additional ships (four DDGs, one FFG, and two LHDs arriving as early as 2009) would be homeported at NAVSTA Mayport. It is important to note that the proposed FFG also could be decommissioned as early as 2014. The total estimated gain in crew stationed at NAVSTA Mayport from Alternative 11 would be 3,899. In addition, there would be an estimated gain of additional DESRON staff (13 officers and 12 enlisted personnel); 30 civilian personnel at SERMC; and 14 enlisted personnel at ATG Mayport. Thus, the total estimated gain in personnel under Alternative 11 would be the same as Alternative 6, at approximately 4,000 (see Table 2.1-1). As shown below in Table 2.3-6 which incorporates base loading projections that account for the crew and staff losses associated with the decommissioning of the KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, decommissioning of the proposed FFG as early as 2014, and reduction in personnel at SERMC, there would be a loss of approximately 1,200 in the net daily population at NAVSTA Mayport under this alternative. A maximum of 28 ships would be homeported at NAVSTA Mayport in 2009, but by 2014, the number of ships homeported would be 17.

Table 2.3-6 Alternative 11 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	2009	2010	2011	2012	2013	2014 End State[7]
Nondeploying Population	6,210	5,740	5,740	5,740	5,740	5,740	5,740
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	39	39	39	39	39	39
Ships Maintenance Personnel[3]	1,504	995	995	995	995	995	995
Ships Personnel in Port[4]	6,036	7,059	6,902	6,902	6,431	5,960	5,333
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**13,825**	**13,668**	**13,668**	**13,197**	**12,726**	**12,098**
Number of Ships Homeported[8]	**22**	**28**	**27**	**27**	**24**	**21**	**17**

Notes: See Table 2.1-2 notes

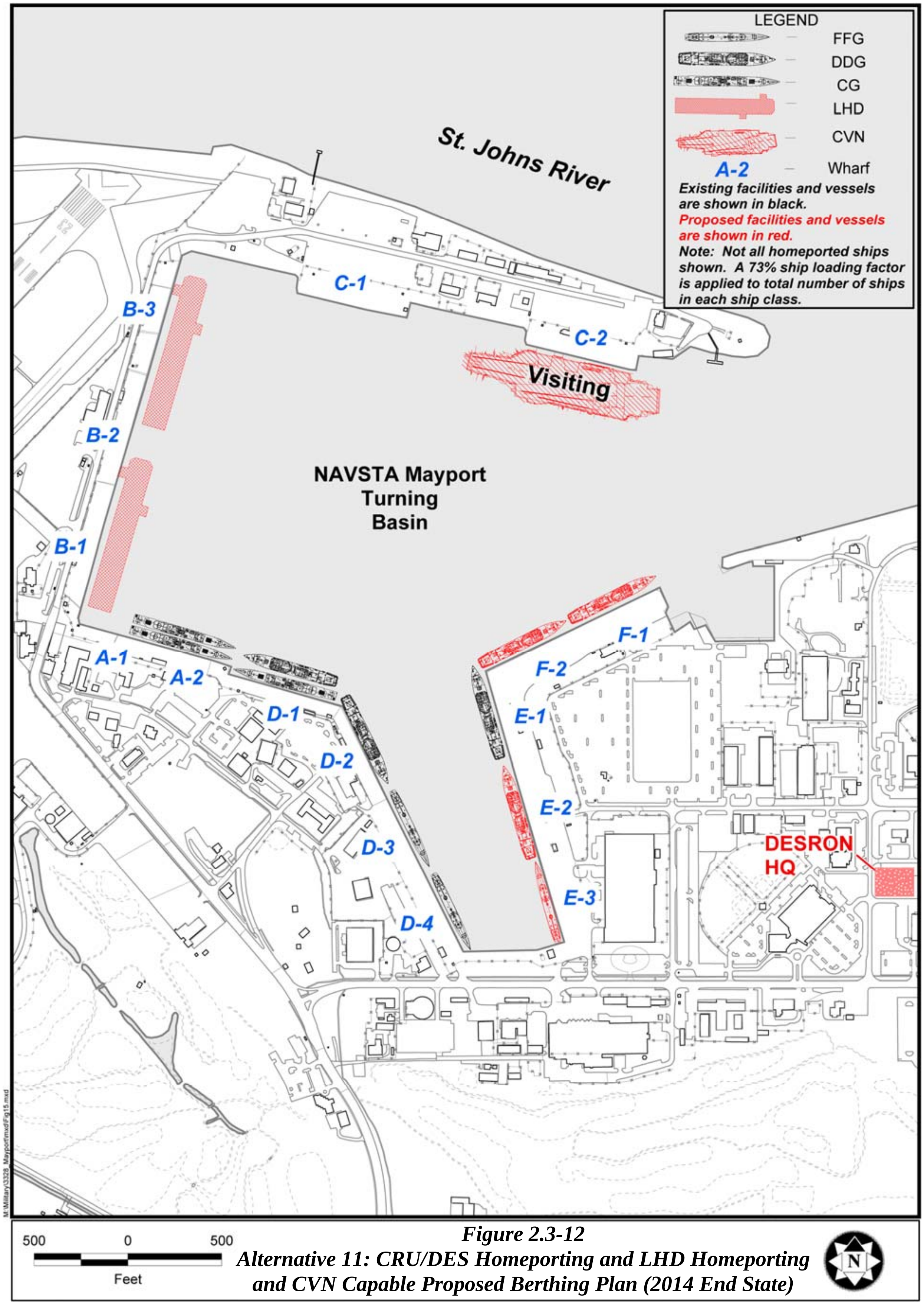


Figure 2.3-12
Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable Proposed Berthing Plan (2014 End State)

Dredging would occur as described in Section 2.3.1. The proposed berthing plan for Alternative 11 is provided in Figure 2.3-12. As with the other alternatives that include CRU/DES Homeporting, Alternative 11 includes a new DESRON headquarters building located and sized the same as described for Alternative 1.

2.4 DESCRIPTION OF ALTERNATIVES INVOLVING HOMEPORTING OF A CVN

2.4.1 ELEMENTS COMMON TO GROUP 3 ALTERNATIVES

The following fundamental components are common to all Group 3 alternatives:

- A CVN would be homeported at NAVSTA Mayport;
- Dredging and dredged material disposal would occur as discussed for Group 2 alternatives;
- CVN nuclear propulsion plant maintenance facilities would be constructed;
- Wharf F would be improved to provide berthing for a CVN during maintenance periods, including upgrading shore power utility systems and installing Type III heavy weather moorings;
- The Massey Avenue corridor would be improved to better accommodate traffic flow near Wharf F;
- Parking structures would be constructed for CVN homeporting alternatives;
- Maintenance requirements of additional ships would be served by SERMC and existing shipyards at NAVSTA Mayport, with the exception of maintenance on the CVN nuclear propulsion plant systems and components, which would be conducted by the CVN nuclear propulsion plant maintenance facilities; and
- The number of ships homeported and the average net daily population would decrease from the 2006 baseline to 2009 due to decommissioning of the KENNEDY in 2007; these numbers would continue to decrease commensurate with scheduled decommissioning of FFGs from 2010 through 2014.

Under all Group 3 alternatives, dredging and dredge disposal actions described for Group 2 alternatives would occur as described in Section 2.3.1. In addition, under CVN homeporting alternatives, facilities not currently available at NAVSTA Mayport to support depot-level repair and maintenance of CVN nuclear propulsion plant systems and components are proposed. Depot-level maintenance also provides stocks of serviceable equipment by using more extensive facilities for repair than are available in lower level maintenance activities. To comply with requirements in OPNAVINST 3000.13C, Personnel Tempo of Operations, depot-level maintenance activities for ships are normally accomplished in the homeport area to the maximum extent practicable. If CVN nuclear propulsion plant maintenance facilities are not constructed at NAVSTA Mayport, the necessary depot-level maintenance availabilities would be accomplished in the Norfolk, Virginia area. Depot-level maintenance availabilities involve system upkeep and testing, lasting about six months. Sending a CVN homeported at NAVSTA Mayport to the Norfolk area for depot-level maintenance availabilities would involve prolonged family separations, contrary to personnel tempo of operations policies, and would reduce the "quality of life" for the crew and their families. The proposed nuclear propulsion plant maintenance facility necessary to support the CVN has three main components: Controlled Industrial Facility (CIF), Ship Maintenance Facility (SMF), and Maintenance Support Facility (MSF).

New parking structures would be constructed to replace parking spaces that would be displaced by constructing the CVN nuclear propulsion plant maintenance facilities and to add additional parking capacity, as required. Wharf F also would be prepared to provide a second berth for the CVN to be used during periods of CVN repair and maintenance, including upgrading the shore power utilities to provide 4160V. (The dredging project previously discussed under Group 2 alternatives would provide adequate project depth of -50 ft MLLW at Berths F-1 and F-2 [-52 ft MLLW total project depth considering allowable overdepth.]) Road improvements would be implemented along the Massey Avenue corridor to accommodate changes in on-base traffic patterns associated with CVN maintenance periods at Wharf F.

2.4.1.1 Controlled Industrial Facility (CIF)

The CIF includes construction of a radiological work facility for inspection, modification, and repair of radiologically controlled equipment and components associated with naval nuclear propulsion plants. It also would provide facilities and equipment for treatment, reclamation, and packaging for disposal of radiologically controlled liquids and solids. It would include nonradiologically controlled spaces for administrative and other support functions. The design would be a site-adapted replication of a CIF constructed at Naval Air Station North Island in San Diego, California in 1996. The proposed facility would be essentially two buildings connected together, sharing a common wall, occupying a total of approximately 52,000 sf. One side would be for industrial work and the other would house administrative support. Construction would be concrete and structural steel on a concrete slab foundation supported by stone columns. Consideration for hurricane wind and storm surge effects will be factored into building design and site arrangement specifications.

The industrial part of the facility would house a radiologically controlled work area. The radiologically controlled portion of the facility would support all aspects of maintenance and repair of ship's radioactive components (except reactor defueling and refueling). These include mechanical disassembly/reassembly, decontamination, machining, liquid processing, inspection, welding, cutting, radiochemistry, waste processing and storage, and shipping. There would be both a high bay and a low bay area with two bridge cranes. Work areas would include a small component repair area with isolated work enclosures for disassembly, inspection, and repair of small workbench-sized items; a large component repair area with larger enclosures for work on items including portable tanks, demineralizers, filter housings, and large propulsion plant components; a small component machining center with a variety of machine tools set up in isolated work enclosures; an area for material storage; a tank receiving area and liquid processing facilities; a hose maintenance area; a liquid waste solidification area; solid radiological waste processing complex; radiochemistry laboratory; and a segregated radioactive waste storage area. The facility would handle only small quantities of low-level radioactivity. Nuclear fuel would not be involved in propulsion plant maintenance work performed at NAVSTA Mayport. The fuel elements in the ship's reactor plant are designed to contain the most highly radioactive materials (called fission products) so none are expected to be encountered in the maintenance of a CVN at NAVSTA Mayport. Chapter 5 contains a more detailed description of the radioactive materials and the stringent design and procedural controls employed in the Naval Nuclear Propulsion Program to protect personnel and the environment.

The CIF would also include an approximately 7,200 sf tank storage facility for portable radioactive liquid waste collection tanks, and an approximately 2,400 sf mixed waste storage facility dedicated to storage of waste that is a mixture of low-level radioactive waste and chemically hazardous waste as described in Chapter 5.

2.4.1.2 Ship Maintenance Facility (SMF)

The SMF includes construction of an approximately 114,000 sf facility containing machine tools, industrial processes, and work functions necessary to perform non-radiological depot-level maintenance on CVN propulsion plants. This facility would allow onsite accomplishment of nearly all specialized propulsion plant work required during a 6-month depot-level availability, with some exceptions such as large diameter pipe bending, heavy machining, metal forging, motor rewinding, and large valve/pump testing.

The facility would be a steel and concrete building serviced by medium capacity jib and bridge cranes ranging up to approximately 25-ton capacity. It would have three primary bays containing major shop work areas. A partial second floor on one side of the building would house supervisory office space and a gauge calibration lab. The first floor area underneath would contain work areas, tool rooms, shop stores, locker rooms, showers, and restroom facilities. The building would have a concrete floor with special foundation areas for major equipment. The building foundations would be supported by methods such as piling or stone columns. Consideration for hurricane wind and storm surge effects would be factored into building design and site arrangement specifications. The SMF would provide shops and spaces for shipfitter shop, sheetmetal shop, pipefitter shop, weld shop, machine shop, electrical shop, electronics shop, insulator shop, paint shop, tool shop and tool rooms, woodworking shop, fabric workers shop, rigger shop, temporary services shop, shipping/receiving/laydown, pure water production, non-destruction-testing laboratory, and chemistry laboratory.

2.4.1.3 Maintenance Support Facility (MSF)

The MSF includes construction of a two-story, approximately 46,000 sf concrete and steel building housing the primary administrative and technical staff offices supporting CVN propulsion plant maintenance, and central area for receiving, inspecting, shipping, and storing materials. This facility would also provide a marshaling point for personnel beginning and ending shift work aboard ships, containing locker, restroom, and shower facilities. In addition, the building would include an area for manufacturing, testing, and storing rigging gear, areas for personnel training and briefings, a teleconference facility, an area for training on equipment mockups, an area for document reproduction and storage, a mail room, and a radiation health office for supplying dosimetry equipment. An area would be provided for accumulation (less than 90 days) of chemically hazardous waste generated from propulsion plant maintenance activities. This waste would be handled in accordance with applicable federal, state, and local regulations. This waste would be picked up by the Navy Public Works Center Jacksonville for storage and transportation to permitted disposal facilities or to the NAVSTA Mayport industrial waste processing facility.

The MSF also would include a 1,300 sf electricvault, 1,600 sf compressed air plant building, fencing and other security measures at the maintenance facility, and two fenced 5,000 sf equipment staging/laydown areas. The staging/laydown areas would be paved, and half of each staging area would be enclosed. Consideration for hurricane wind and storm surge effects would be factored into building design and site arrangement specifications.

2.4.1.4 Shipboard Propulsion Plant Maintenance

Homeporting of a CVN at NAVSTA Mayport would involve repair and maintenance work on both radiological and nonradiological propulsion plant systems. Repair and maintenance work would primarily be done onboard the ships. Pier-side maintenance facilities would support any shipboard work as well as perform work on components removed from the ships.

Refueling CVN nuclear reactors will not be accomplished at NAVSTA Mayport. This type of work requires special assets only found at selected nuclear–capable shipyards. Therefore, any operation requiring removal, installation, handling, or transportation of nuclear fuel will be accomplished at a selected nuclear-capable shipyard, not at NAVSTA Mayport.

During the repair availability, temporary support systems would be required. Tanks would be located adjacent to the ship to receive radioactive liquids drained from the nuclear propulsion plant, oily wastewater from bilges, and effluents from ship's sanitary tanks for processing. Temporary high efficiency particulate air (HEPA)-filtered ventilation systems equipped with Air Particle Samplers would be installed. The ship would also be supplied with fresh water, compressed air, and propulsion plant make-up water as required.

Work on propulsion plant systems would typically involve repair or replacement of various components including piping, valves, pumps, and gauges. The primary propulsion plant systems contain radioactive materials in the form of activated corrosion and wear products. Whenever the primary systems would be opened, stringent radiological controls would be employed including the use of contamination containments and, when necessary, localized ventilation equipped with HEPA filters to prevent the spread of contamination.

Thermal insulation would be removed to allow access to propulsion plant systems. Work performed on piping and components would include cutting, grinding, machining, welding, valve packing, and seal and gasket replacement. Nondestructive methods such as the use of penetrating dye, radiography, ultrasonics, magnetic particle testing, and eddy current testing would be used for inspecting system and component integrity. Resin and filter media would be removed and replaced.

Maintenance of the propulsion plant spaces would also require paint chipping and scraping, grinding, welding, sand or grit blasting, solvent wipe down, and touch-up painting as well as the use of carbon arc torches for removing structures and making access cuts for removal of components that are too large for existing hatches. Electrical maintenance work would include repair, removal, or replacement of various electrical panels, cabinets, wiring and cables.

2.4.1.5 Wharf F Improvements

Utility and structural upgrades to Wharf F would be needed to provide maintenance capability for the CVN. The homeported CVN would be moved from Wharf C-2 to Wharf F when maintenance is required. While Wharf C-2 currently provides all necessary utilities, this alternative would require upgrades to utilities at Wharf F to provide potable water, salt water, pure water (distilled to meet CVN requirements), steam, electrical power, communications, sanitary sewer, oily waste, compressed air, and fuel in sufficient quantity and quality to support a CVN. Installation of plate anchor embedded high wind Type III heavy weather moorings would be required. Type III moorings would allow for a CVN to remain at the Wharf if it were under maintenance and not capable of relocating in the event of an approaching hurricane. A crane would be required at the wharf to move large ship components through the roof hatches in the CIF and other loads from the ships. Structural deck upgrades would be required to allow for necessary ship maintenance operations. The dredging project described under Group 2 alternatives would provide adequate berth depth of -50 ft MLLW at Berths F-1 and F-2 (-52 ft MLLW total project depth considering allowable overdepth).

2.4.1.6 CVN Nuclear Propulsion Plant Maintenance Personnel

Personnel supporting CVN nuclear propulsion plant maintenance would fluctuate based on the CVN maintenance schedule. It is estimated the CVN would enter a six-month maintenance availability period every two years. The first two of these six-month periods would be conducted in the ship's homeport at NAVSTA Mayport. Every third maintenance availability would be conducted in dry-dock at a nuclear-capable shipyard. CVN nuclear propulsion plant maintenance manning would be approximately 50 people when no CVN maintenance is being conducted, but would increase by an average of 750 for a six-month maintenance availability (amounting to an increase of 375 in the annual net daily population in these years).

2.4.1.7 Massey Avenue Corridor Improvements

The Massey Avenue corridor would be improved to better accommodate traffic flow to and from the CVN nuclear propulsion plant maintenance facilities near Wharf F. During periods of CVN maintenance, approximately 800 maintenance personnel and approximately 3,140 ship's crew would be destined for the Wharf F area in addition to existing SERMC personnel and contractors performing maintenance on other homeported ships in same general vicinity. As indicated in Figure 2.4-1, proposed improvements include:

- Widening Massey Avenue with an additional through lane in both directions with a turfed median from Maine Street to Baltimore Street.

- Realigning the Massey Avenue and Maine Street intersection to make the northbound right/ westbound left movements the new through movements to better accommodate major traffic demands through the intersection, particularly during peak hours. With this configuration, two through lanes in each direction would need to be provided, along with two left-turn lanes northbound. The eastbound approach would require two right-turn lanes, plus one left-turn lane.

- Improving the intersection of Massey Avenue and Supply Street to include an actuated-coordinated traffic signal equipped with pedestrian pushbuttons and signal heads to facilitate the significant amount of pedestrian crossings at this intersection. The pedestrian signal to the west of this intersection would be removed. The eastbound left-turn lane length would be increased 100 ft to 225 ft. As identified above, this intersection also would include an additional through lane in each direction on Massey Avenue.

- Improving the intersection of Massey Avenue and Bon Homme Richard Street to add a westbound right turning lane with a 50 ft storage length. The parking lot access would be widened south of the intersection and realigned such that it forms the northbound leg of this intersection. In addition, a curbed island from this new access point west to the edge of the parking lot would be added to restrict traffic flow to this access point. Also, an actuated coordinated signal would be installed. (As identified above, this intersection also would include an additional through lane in each direction on Massey Avenue).

- Adding modern roundabouts at the intersections of Massey Avenue and Baltimore Street and Moale Avenue and Baltimore Street. Roundabouts differ from traditional traffic circles and are characterized by three features: (1) a requirement to yield at entry, giving a vehicle on the circular roadway right-of-way; (2) a deflection of the approaching vehicle around the circular island; and (3) a flare or widening of the approach to match the width of the circular roadway.

- Adding turning lanes at the intersection of Moale Avenue and Maine Street would alleviate some traffic flow on Massey Avenue. Additional turning lanes would include an eastbound left turning lane with 75 ft storage length, a westbound left turning lane with 225 ft storage length, a southbound right turning lane with a 75 ft storage length, and increasing the storage length of the westbound right turning lane from 50 ft to 75 ft.

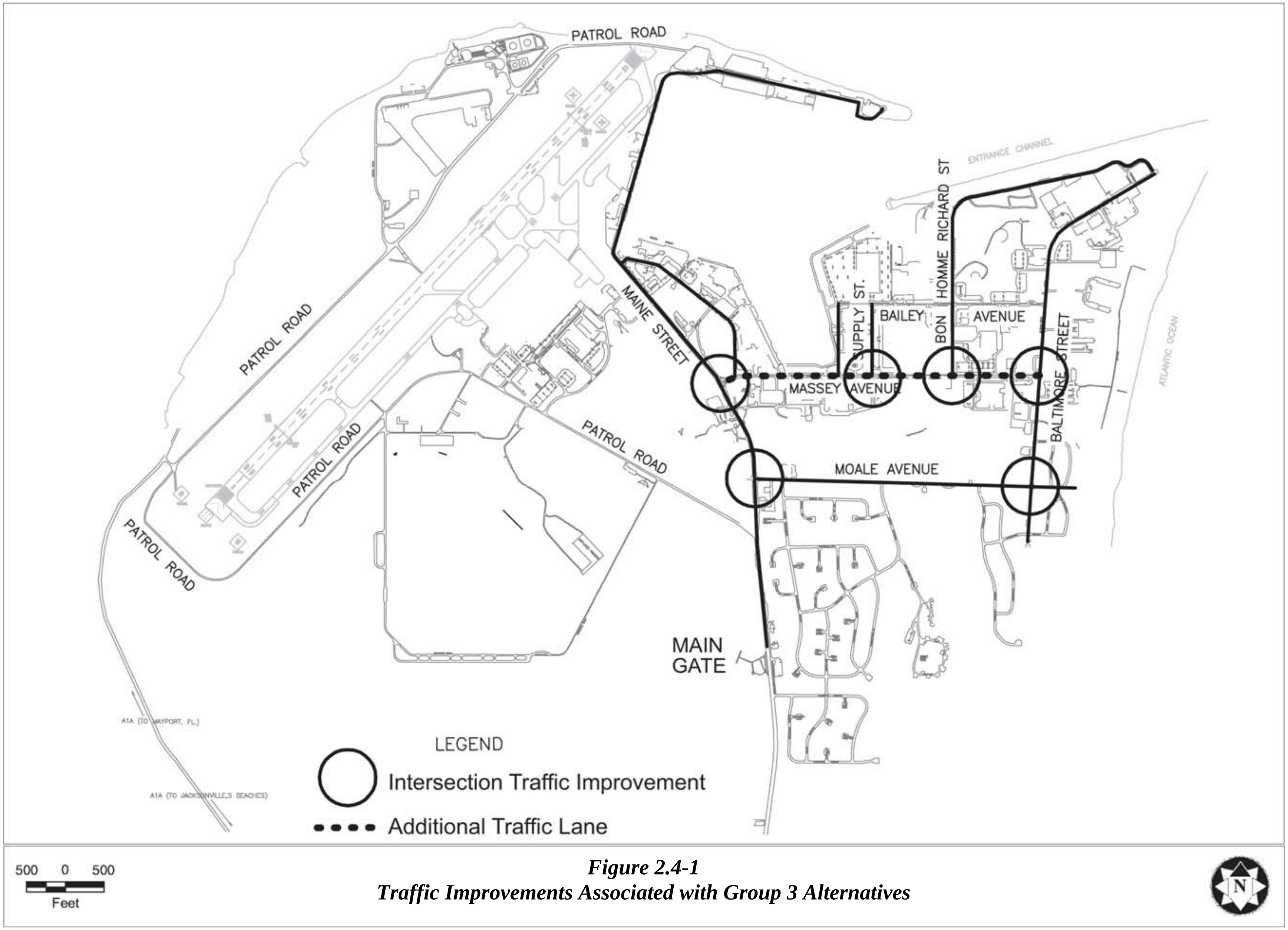


Figure 2.4-1
Traffic Improvements Associated with Group 3 Alternatives

2.4.1.8 Phasing Plan

This group of alternatives requires numerous different construction activities to be managed in phases over a period of several years. Programming and design would be required prior to construction of facilities. Assuming that Military Construction (MILCON) projects could start as early as 2011, construction/improvements would be generally phased as follows:

- Dredging started in 2011 and completed in 2012 (approximately 18 months)
- Wharf F improvements started in 2011 and completed in 2013 (approximately 24 months)
- Parking improvements started in 2011 and completed in 2013 (approximately 24 months)
- Road improvements started 2011 and completed in 2013 (approximately 24 months)
- CVN nuclear propulsion plant maintenance facilities (CIF/SMF/MSF) construction started in 2011 and completed in 2014 (approximately 33 months), followed by equipment outfitting which would also be completed as early as 2014 (approximately 9 months).
- Arrival of CVN for homeporting as early as 2014. This date is dependent upon the completion of CIF/SMF/MSF facilities construction and outfitting, which could occur as early as 2014. For purposes of analysis in this FEIS, projected ship and personnel loading is based upon 2014 arrival, rather than 2012 as was anticipated in the DEIS. The end state net daily population for all Group 3 alternatives is less than presented in the DEIS because the proposed infrastructure completion date and earliest CVN homeporting date has slipped from 2012 to 2014 which postpones the influx of maintenance personnel associated with CVN propulsion plant maintenance to sometime beyond 2015 depending on particular CVN maintenance schedules.

2.4.2 ALTERNATIVE 4: CVN HOMEPORTING

Under Alternative 4, one CVN could be homeported at NAVSTA Mayport as early as 2014. The proposed berthing plan for this alternative is depicted in Figure 2.4-2. While the figure illustrates the CVN berthed at Wharf C-2, the homeported CVN would be berthed at Wharf F, NAVSTA Mayport's general maintenance wharf, during periods of CVN maintenance and repair. The ship's crew personnel gain, as estimated by the average complement (without the air wing) for a CVN, would be 2,981 enlisted and 159 officer personnel or a total of 3,140 personnel. There would be approximately 50 CIF/SMF/MSF personnel when CVN maintenance is not actively occurring at NAVSTA Mayport (see Table 2.1-1).

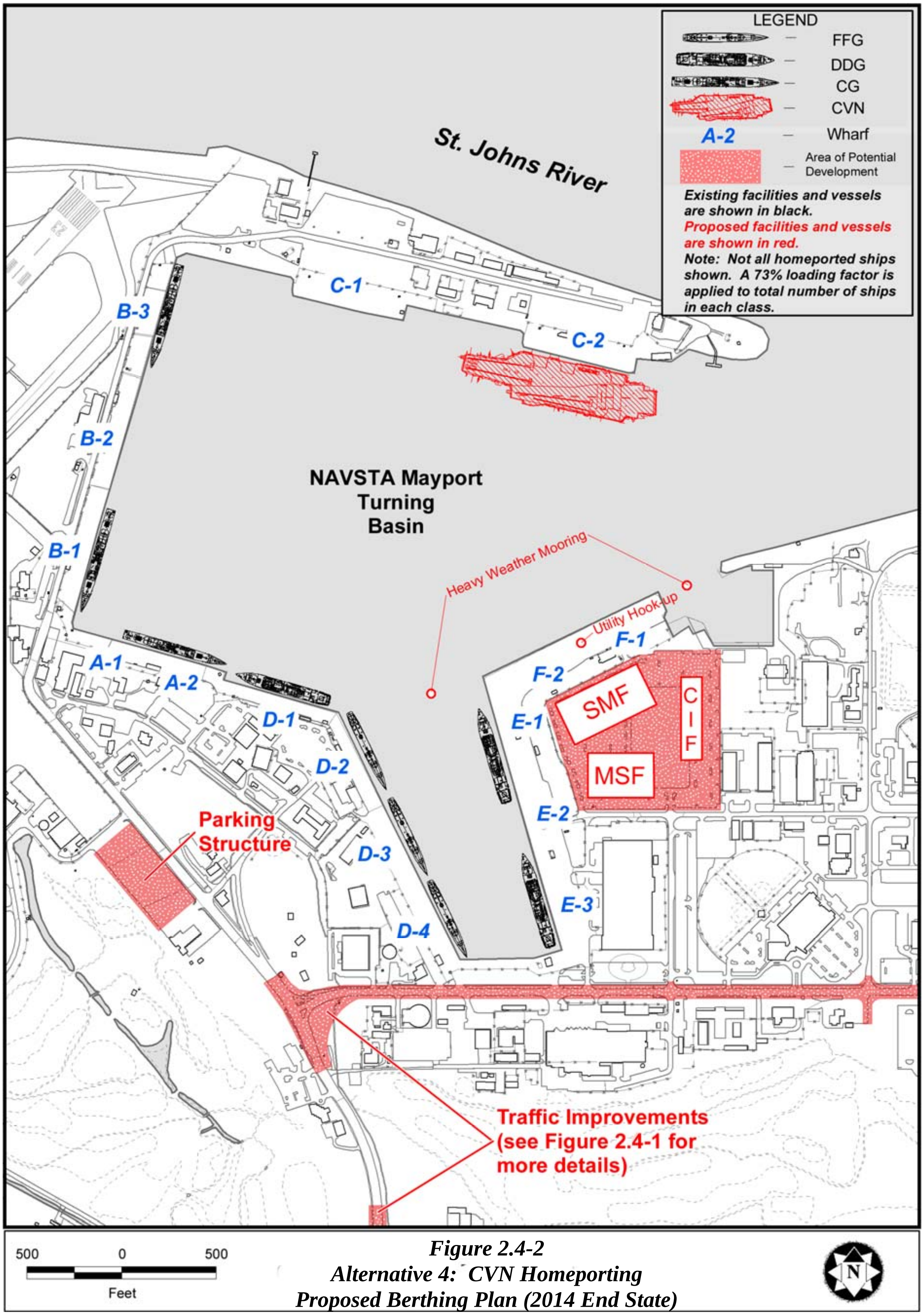


Figure 2.4-2
Alternative 4: CVN Homeporting
Proposed Berthing Plan (2014 End State)

As shown in Table 2.4-1, the net daily population would decrease by approximately 1,600 between the 2006 baseline and the 2014 end state year. This is due to loss of personnel associated with decommissioning of KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, and SERMC military personnel downsizing between baseline and 2009. The total number of ships homeported at NAVSTA Mayport would decrease from 22 to 12 by 2014.

Table 2.4-1 Alternative 4 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State[7]**
Nondeploying Population	6,210	5,671	5,671	5,671	5,671	5,671	5,721
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	0	0	0	0	0	0
Ships Maintenance Personnel[3]	1,504	965	965	965	965	965	1,015
Ships Personnel in Port[4]	6,036	4,213	4,056	4,056	3,585	3,114	4,936
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**10,910**	**10,753**	**10,753**	**10,282**	**9,811**	**11,682**
Number of Ships Homeported	**22**	**21**	**20**	**20**	**17**	**14**	**12**

Notes: See Table 2.1-2 notes

The area of potential development for the CIF, SMF, and MSF south of Wharf F and east of Wharf E currently is occupied by surface parking (1,653 spaces) and stormwater drainage and swale area. With the loss of these 1,653 parking spaces, there would be a deficit of 550 parking spaces under Alternative 4 in the 2014 end state. Replacement parking would be provided in the form of a new 2.5-level parking structure (see Figure 2.4-2). The 349 existing surface parking spaces at this location would be replaced by 1,080 spaces in the structure for a net gain of 731 parking spaces at this location, which meets the 550-space deficit created under Alternative 4.

Improvements to the stormwater drainage in the vicinity of Wharf F would be factored into site design to meet regulatory requirements. This would likely include redesign of the existing dry detention pond at Wharf F and additional measures towards meeting NAVSTA Mayport's goal of reducing nutrient loads to the Lower St. Johns River Basin in accordance with the Total Maximum Daily Load program. Plate anchor embedded heavy weather moorings would be installed in the turning basin at Wharf F. Dredging would occur as described in Section 2.3.1.

2.4.3 ALTERNATIVE 8: CRU/DES HOMEPORTING AND CVN HOMEPORTING

Alternative 8 combines Alternatives 1 and 4 homeporting options. Additional DESRON staff and a total of six additional ships (four DDGs, one FFG, and one CVN) would be homeported at NAVSTA Mayport. The DDGs and FFG could be homeported as soon as 2009 and the CVN could arrive as early as 2014. The increase in crew stationed at NAVSTA Mayport from Alternative 8 would be 4,980

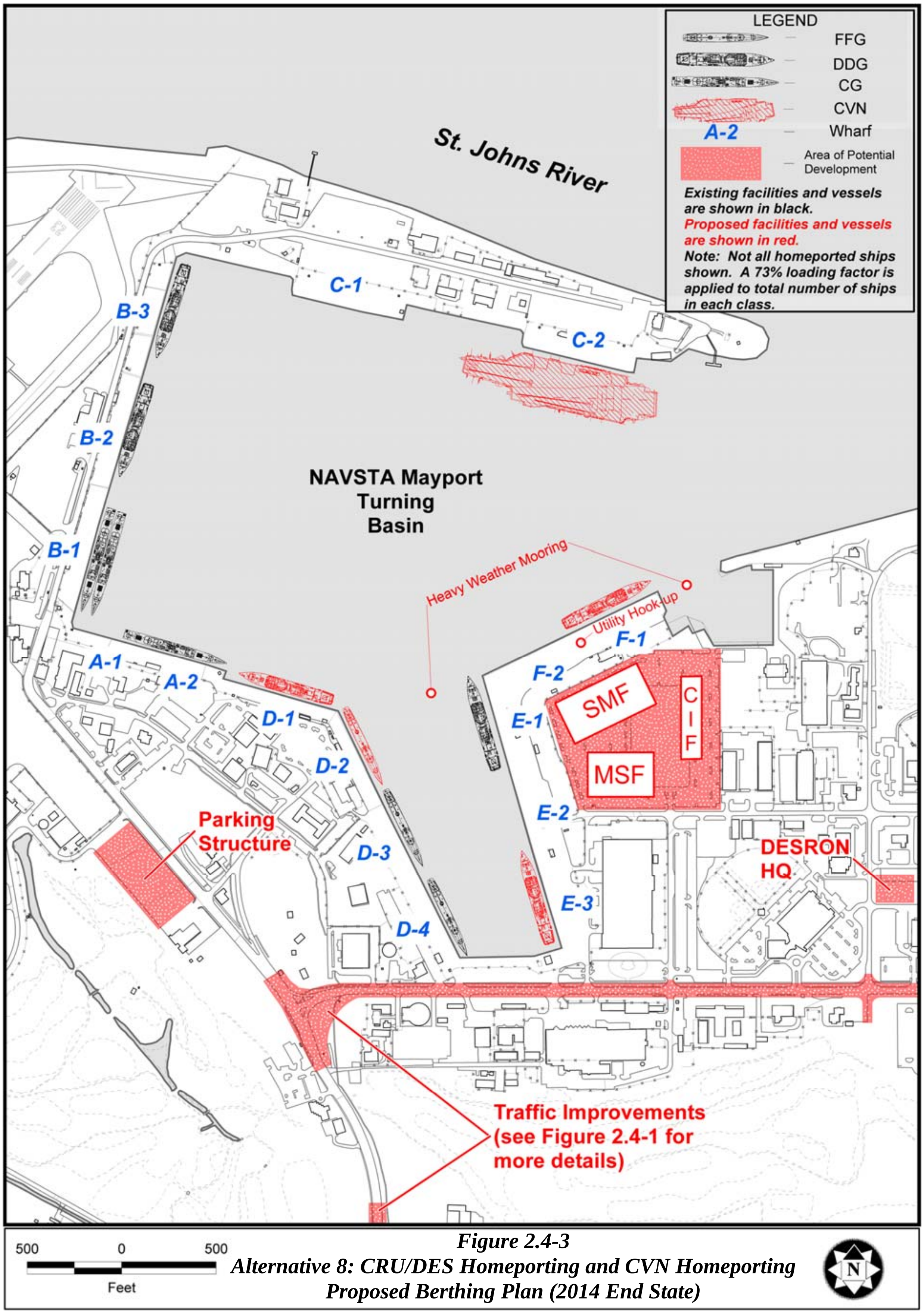


Figure 2.4-3
Alternative 8: CRU/DES Homeporting and CVN Homeporting Proposed Berthing Plan (2014 End State)

personnel. The DESRON staff would add another 13 officers and 12 enlisted other personnel. In addition, there would be approximately 20 civilian personnel needed at SERMC, 10 additional enlisted personnel needed at ATG Mayport, and approximately 50 permanent civilian workers needed to support the CIF/SMF/MSF. Thus the total gain in personnel from Alternative 8 would be approximately 5,000 (see Table 2.1-1).

As shown in Table 2.4-2, the net daily population would decrease by approximately 430 between 2006 and 2014, which considers decommissioning of KENNEDY in 2007, decommissioning of 10 FFGs between 2009 and 2014, decommissioning in 2014 of the additional FFG proposed as part of this alternative, and SERMC military personnel downsizing. The number of ships homeported would increase from 22 to 26 in 2009, then steadily decrease to 16 by the 2014 end state year.

The proposed berthing plan for Alternative 8 is provided in Figure 2.4-3. While the figure illustrates the CVN berthed at Wharf C-2, the homeported CVN would also be berthed at Wharf F, NAVSTA Mayport's general maintenance wharf, during periods of CVN maintenance and repair. Ships berthed at F-1, F-2, and E-1 would be moved to Wharf C-2 or other berths during periods when the CVN is berthed at Wharf F. As with Alternative 4, the CIF, SMF, and MSF would be constructed in the area south of Wharf F and east of Wharf E.

Table 2.4-2 Alternative 8 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State**[7]
Nondeploying Population	6,210	5,726	5,726	5,726	5,726	5,726	5,776
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	35	35	35	35	35	35
Ships Maintenance Personnel[3]	1,504	985	985	985	985	985	1,035
Ships Personnel in Port[4]	6,036	5,479	5,322	5,322	4,852	4,381	6,045
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,231**	**12,074**	**12,074**	**11,603**	**11,133**	**12,847**
Number of Ships Homeported[8]	**22**	**26**	**25**	**25**	**22**	**19**	**16**

Notes: See Table 2.1-2 notes

Parking spaces would be lost, creating an 1,118-space deficit in parking (adjusted for the personnel loading under Alternative 8). Replacement parking would be provided in the form of a new 4-level parking structure (see Figure 2.4-3). The 349 existing surface parking spaces at this location would be replaced by 1,728 spaces in the structure for a net gain of 1,379 parking spaces at this location, which meets the 1,118-space deficit created under Alternative 8. Also, as with Alternative 4, stormwater improvements would be factored into site design to meet regulatory requirements. As with the other alternatives involving CRU/DES homeporting, a new 6,000 sf DESRON headquarters building would be

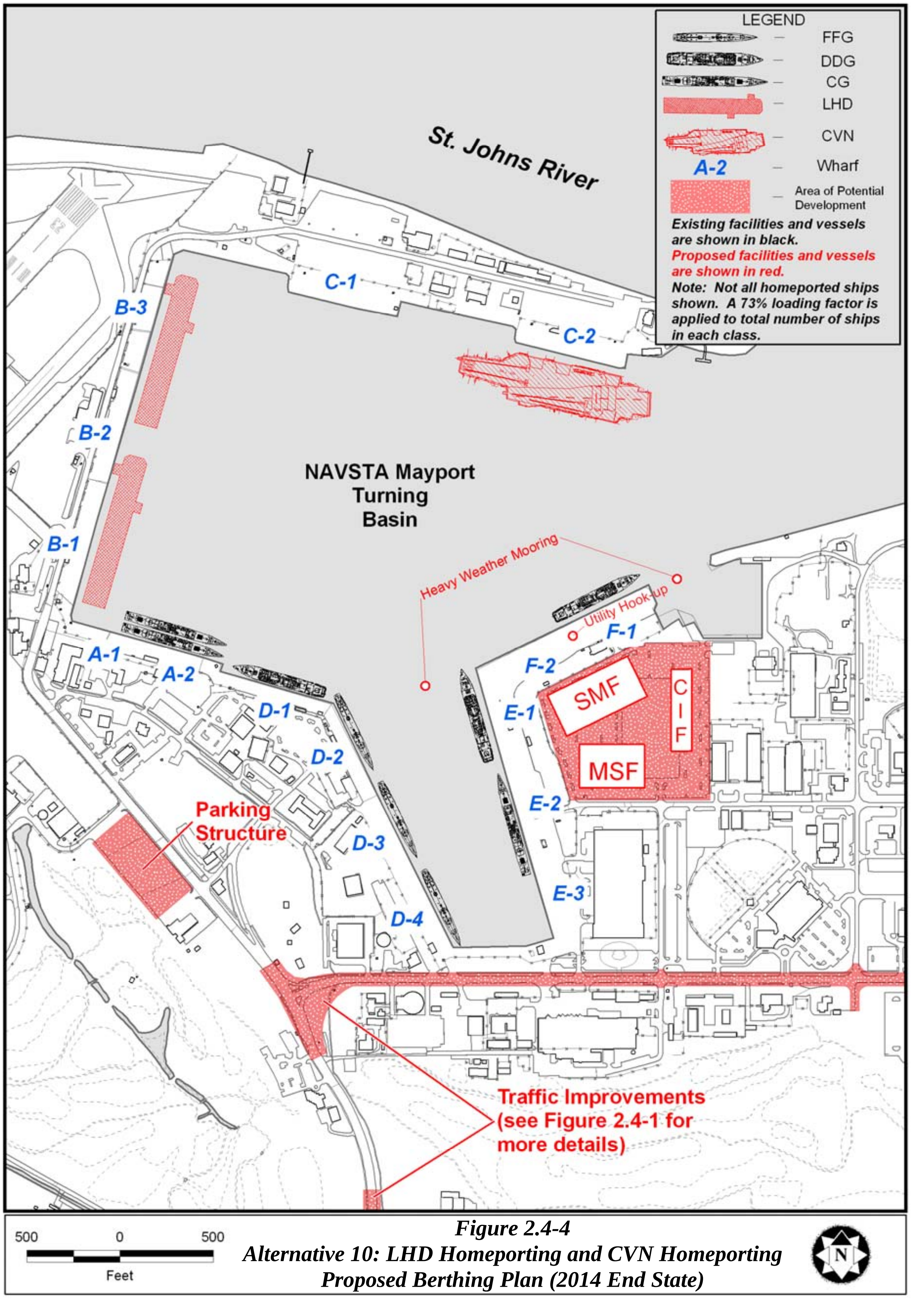


Figure 2.4-4
Alternative 10: LHD Homeporting and CVN Homeporting Proposed Berthing Plan (2014 End State)

required under Alternative 8 (see Figure 2.4-3). Plate anchor embedded heavy weather moorings would be installed in the turning basin at Wharf F. Dredging would occur as described in Section 2.3.1.

2.4.4 ALTERNATIVE 10: LHD HOMEPORTING AND CVN HOMEPORTING

Alternative 10 combines Alternatives 2 and 4 homeporting options. A total of three additional ships (two LHDs as early as 2009 and one CVN as early as 2014) would be homeported at NAVSTA Mayport. The estimated gain in personnel stationed at NAVSTA Mayport under Alternative 10 would be 5,304 in crew; 50 workers for the CIF/SMF/MSF; 10 civilian personnel at SERMC; and five enlisted personnel at ATG Mayport. Thus, the total net daily personnel gain under Alternative 10 would be approximately 5,400 (see Table 2.1-1). As shown in Table 2.4-3, by 2014 the average net daily population at NAVSTA Mayport under Alternative 10 would essentially be the same as the baseline. Between the baseline and 2014, net daily population would fluctuate based on decommissioning of KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, and SERMC personnel downsizing. Under this alternative, the number of ships homeported would decrease from 22 in 2006 to 14 in 2014.

Table 2.4-3 Alternative 10 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State[7]**
Nondeploying Population	6,210	5,686	5,686	5,686	5,686	5,686	5,736
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	5	5	5	5	5	5
Ships Maintenance Personnel[3]	1,504	975	975	975	975	975	1,025
Ships Personnel in Port[4]	6,036	5,793	5,636	5,636	5,165	4,694	6,515
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**12,504**	**12,347**	**12,347**	**11,877**	**11,406**	**13,277**
Number of Ships Homeported	**22**	**23**	**22**	**22**	**19**	**16**	**14**

Notes: See Table 2.1-2 notes

The proposed berthing plan for Alternative 10 is provided in Figure 2.4-4. While the figure illustrates the CVN berthed at Wharf C-2, the homeported CVN would be berthed at Wharf F, NAVSTA Mayport's general maintenance wharf, during periods of CVN maintenance and repair. Ships berthed at F-1, F-2, and E-1 would be moved to Wharf C-2 or other berths during periods when the CVN is berthed at Wharf F. As with Alternatives 4 and 8, the site for the CIF, SMF, and MSF would be south of Wharf F and east of Wharf E. The parking spaces at this site would be lost, and create a deficiency of 1,445 parking spaces (adjusted for the personnel loading under Alternative 10). Replacement parking would be provided in the form of a new 4.5-level parking structure (see Figure 2.4-4). The 349 existing surface parking spaces at this location would be replaced by 1,944 spaces in the structure for a net gain of 1,595 parking spaces at this location, which meets the 1,445-space deficit created under Alternative 10. Also, as with Alternatives 4 and 8, stormwater improvements would be factored into site design to meet regulatory requirements. Plate anchor embedded heavy weather moorings would be installed in the turning basin at Wharf F. Dredging would occur as described in Section 2.3.1.

2.4.5 ALTERNATIVE 12: CRU/DES HOMEPORTING AND LHD HOMEPORTING AND CVN HOMEPORTING

Alternative 12 combines Alternatives 1, 2, and 4 homeporting options. A total of eight additional ships (four DDGs, one FFG, and two LHDs arriving as early as 2009, and one CVN as early as 2014) would be homeported at NAVSTA Mayport. It is important to note that the proposed FFG also would be decommissioned as early as 2014. The gain in ships crew stationed at NAVSTA Mayport from Alternative 12 would be 7,039 personnel. In addition, there would be a gain of 50 civilian workers for the CIF/SMF/MSF; 25 additional DESRON staff; 30 SERMC civilian personnel; and 14 ATG enlisted personnel. Therefore, total estimated gain in personnel at NAVSTA Mayport under Alternative 12 would be approximately 7,200 (see Table 2.1-1). As shown in Table 2.4-4, which incorporates base loading projections that account for crew and staff losses associated with decommissioning of the KENNEDY, decommissioning of 10 FFGs between 2010 and 2014, decommissioning in 2014 of the additional FFG proposed as part of this alternative, and SERMC military personnel downsizing, there would be a gain of approximately 1,200 in average daily loading at NAVSTA Mayport. The number of ships homeported would increase in 2009 to 28 and decrease to 18 by 2014.

Table 2.4-4 Alternative 12 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State**[7]
Nondeploying Population	6,210	5,740	5,740	5,740	5,740	5,740	6,790
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	39	39	39	39	39	39
Ships Maintenance Personnel[3]	1,504	995	995	995	995	995	1,045
Ships Personnel in Port[4]	6,036	7,059	6,902	6,902	6,431	5,960	7,625
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**13,825**	**13,668**	**13,668**	**13,197**	**12,726**	**14,441**
Number of Ships Homeported[8]	**22**	**28**	**27**	**27**	**24**	**21**	**18**

Notes: See Table 2.1-2 notes

The proposed berthing plan for Alternative 12 is provided in Figure 2.4-5. As with the other alternatives in this grouping, the homeported CVN would be berthed at Wharf C but would be berthed at Wharf F during periods of CVN maintenance and repair. Ships berthed at F-1, F-2, and E-1 would be moved to Wharf C-2 during periods when the CVN is berthed at Wharf F. The site for the CIF, SMF, and MSF would be south of Wharf F and east of Wharf E.

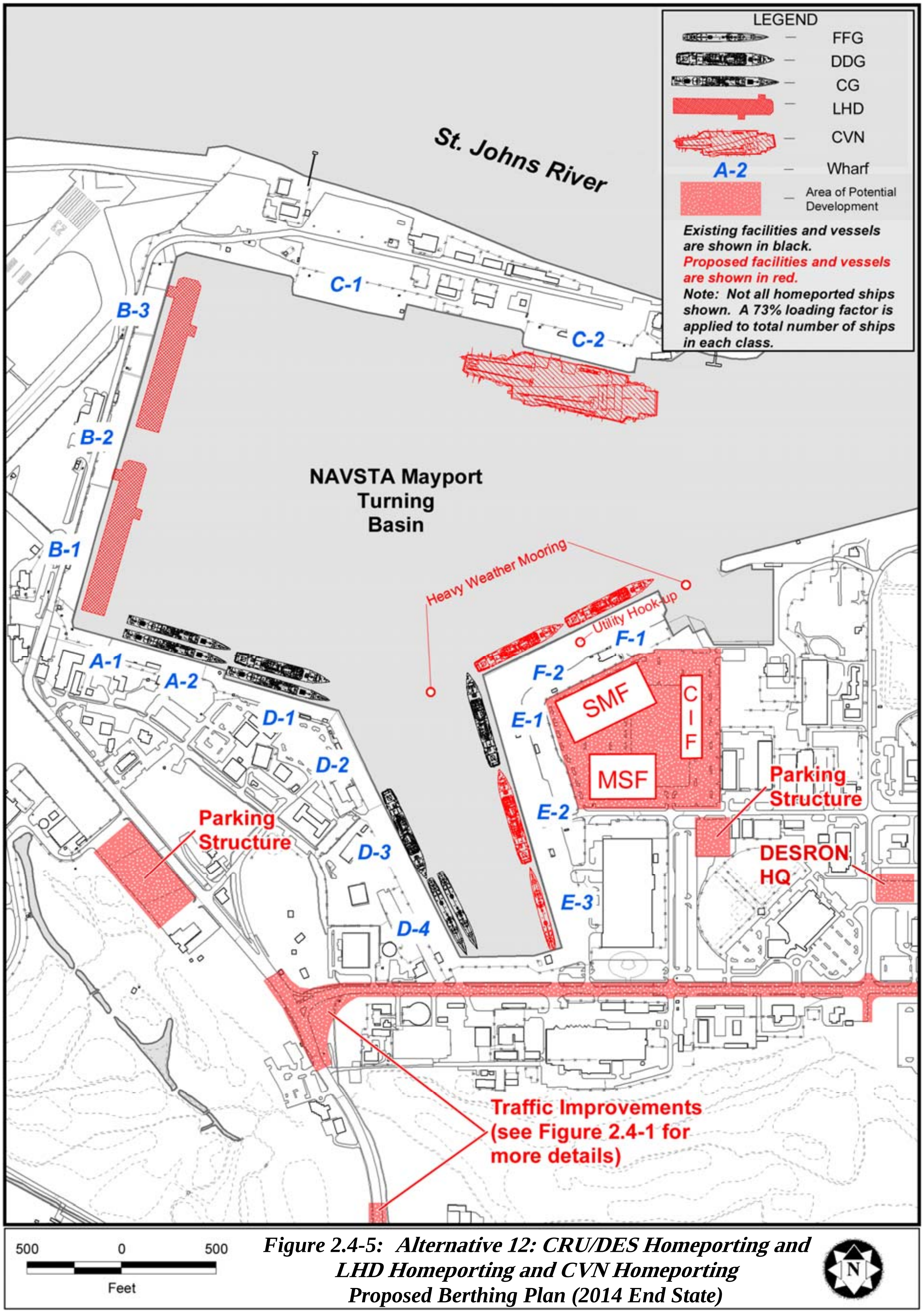


*Figure 2.4-5: **Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting Proposed Berthing Plan (2014 End State)***

The parking spaces at this site would be lost, and create a deficiency of 2,078 parking spaces (adjusted for the personnel loading under Alternative 12). Replacement parking would be provided in the form of a new five-level parking structure and a 4- level parking structure (see Figure 2.4-5). The 451 existing surface spaces at these locations would be replaced with 2,632 spaces in the new structures for a net gain of 2,181 spaces at these locations, meeting the 2,078-space deficit created under Alternative 12. Also, as with the other alternatives in this grouping, stormwater improvements would be factored into site design to meet regulatory requirements. Plate anchor embedded heavy weather moorings would be installed in the turning basin at Wharf F. Dredging would occur as described in Section 2.3.1. As with the other five alternatives that include CRU/DES homeporting, Alternative 12 includes construction of a DESRON headquarters building sized and located as described for Alternative 1 (see Figure 2.4-5).

2.5 ALTERNATIVE 13: NO ACTION ALTERNATIVE

Under the No Action Alternative, no additional fleet surface ships would be homeported at NAVSTA Mayport (Figure 2.5-1). As shown in Table 2.5-1, considering decommissioning of KENNEDY in 2007, decommissioning of 10 FFGs between 2010 and 2014, and SERMC downsizing, the average net daily population of NAVSTA Mayport would decrease by 3,900 by 2014. In 2014, there would be 11 fleet surface ships homeported at NAVSTA Mayport. NAVSTA Mayport would retain the ability to berth a CVN in a limited fashion; existing draft restrictions would remain in effect. The dredging project as described in Section 2.3.1 would not occur.

Table 2.5-1 Alternative 13 Annual Average Daily Loading and Number of Ships Homeported

	2006 Baseline[6]	**2009**	**2010**	**2011**	**2012**	**2013**	**2014 End State[7]**
Nondeploying Population	6,210	5,621	5,621	5,621	5,621	5,621	5,621
Other Station Personnel[1]	4,706	4,706	4,706	4,706	4,706	4,706	4,706
DESRON/PHIBRON/ATG Staff[2]	0	0	0	0	0	0	0
Ships Maintenance Personnel[3]	1,504	965	965	965	965	965	965
Ships Personnel in Port[4]	6,036	4,213	4,056	4,056	3,585	3,114	2,643
Air Squadron Personnel on Station[5]	1,026	1,026	1,026	1,026	1,026	1,026	1,026
Average Net Daily Population	**13,272**	**10,910**	**10,753**	**10,753**	**10,282**	**9,811**	**9,340**
Number of Ships Homeported	**22**	**21**	**20**	**20**	**17**	**14**	**11**

Notes: See Table 2.1-2 note

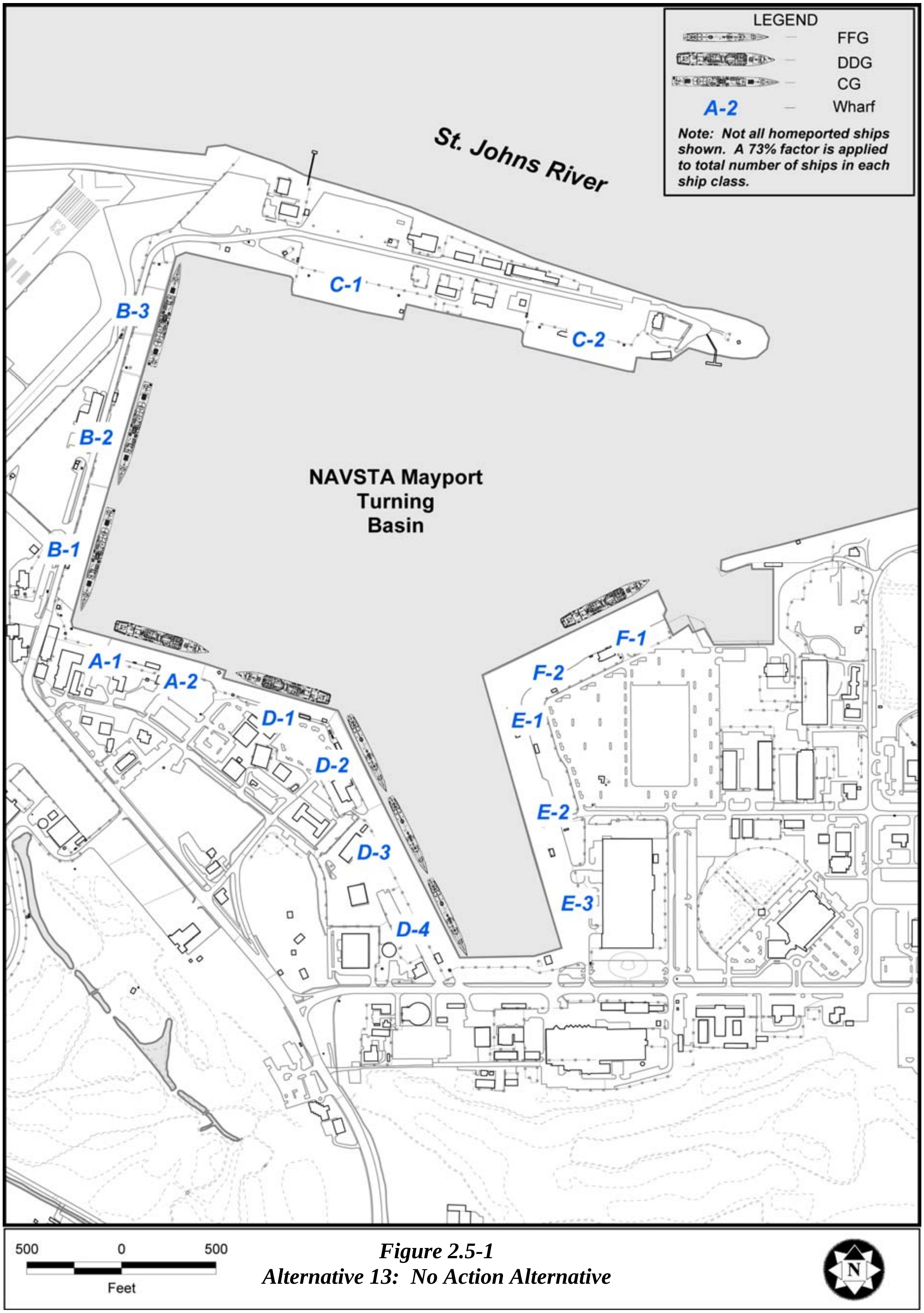


Figure 2.5-1
Alternative 13: No Action Alternative

2.6 ALTERNATIVES EVALUATION PROCESS

All alternatives identified in Section 2.2 were evaluated for their ability to meet the purpose and need for the proposed action. As discussed in Section 1.2, the purpose of the proposed action is to ensure effective support of fleet operational requirements through efficient use of waterfront and shore side facilities. The Navy needs to utilize the available facilities at NAVSTA Mayport in an effective and efficient manner, thereby minimizing new construction. As such, the following factors were used to evaluate the alternatives:

- Effective support of fleet operations
- Utilization of available facilities to minimize new construction
  - Use of existing pierside utilities
  - Use of existing maintenance and repair facilities
  - Use of existing command and control facilities
  - Use of existing military personnel support facilities
- Efficient use of waterside facilities/berths
  - Access to berths
  - Availability of Berth C-1 as weapons handling area
  - Availability of Wharf E and Wharf F as primary maintenance wharves
  - Compliance with harbor operations/nesting restrictions

2.6.1 EFFECTIVE SUPPORT OF FLEET OPERATIONS

All 12 action alternatives effectively support fleet operations, however Group 3 alternatives have moderate constraints to overcome. Homeporting of DDGs, FFGs, LHDs, an ARG (LHD, LPD, and LSD), a CVN or combinations thereof at NAVSTA Mayport would be consistent with the FRP. Fleet operational training along the East Coast in established fleet operational areas and training range complexes is not dependent upon homeport location of ships. Fleet ships homeported at NAVSTA Mayport currently join with Carrier Strike Groups and Expeditionary Strike Groups for deployment and would continue to do so. Group 2 alternatives, which would dredge to provide necessary water depths to meet CVN requirements would support fleet operations by providing a second CVN capable port along the East Coast. Group 3 alternatives, which all would homeport a CVN at NAVSTA Mayport, would further support fleet operations by providing a second CVN homeport along the East Coast, ensuring an opportunity for the Navy to disperse its East Coast CVN fleet if determined operationally necessary by CNO. However, moderate constraints would be incurred by Group 3 alternatives, including the logistical inefficiencies, operational impacts, and increased time away from home base associated with having the majority of the carrier air wing located in a separate geographic location. As the distance between the squadron's home base and the CVN increase, so too does the time necessary for transportation of squadron equipment and personnel. Prolonging the embark and return to home base process increases personnel tempo of operations and reduces the number of days available for squadron training, critical in the days leading up to a deployment.

2.6.2 UTILIZATION OF AVAILABLE FACILITIES TO MINIMIZE NEW CONSTRUCTION

2.6.2.1 Use of Existing Pierside Utilities

Existing utilities are sufficient for all Group 1 alternatives: no significant utilities upgrades are required for homeporting of additional FFGs, DDGs, LHDs, LSD, or LPD. CVN capability as proposed under Group 2 alternatives would require the provision of pure water (distilled to meet CVN requirements) at Wharf C-2 to support a CVN visiting for longer than 7 days. This requirement would be met by providing a mobile pure water source. Under all Group 3 alternatives, shore power at Wharf F would need to be upgraded from 480 V to 4160 V to meet CVN power requirements, and a pure water facility would be constructed to meet CVN pure water requirements. No significant utilities upgrades are required for FFGs, DDGs, and LHDs also proposed under Group 2 and 3 alternatives.

2.6.2.2 Use of Existing Maintenance and Repair Facilities

NAVSTA Mayport has extensive ships' maintenance capabilities provided by SERMC and its shipyards. The existing maintenance and repair facilities would meet the needs for all ships proposed under Group 1 and Group 2 alternatives for all routine and depot level maintenance that is typically completed at homeport. High level maintenance of the LHD requiring a dry dock would not occur at NAVSTA Mayport. High level maintenance on LHDs currently occurs at Norfolk Naval Shipyard. For Group 3 alternatives, which all propose CVN homeporting, non-propulsion plant maintenance and repair activities would occur similarly to historic aircraft carrier maintenance at NAVSTA Mayport when the KENNEDY was homeported there. However, routine and depot-level maintenance of the CVN nuclear propulsion plant and components would require the construction of the CIF, SMF, and MSF to adequately perform the required maintenance that must be completed in CVN homeports. High level maintenance of CVNs that occurs approximately every eight years requires a dry dock and would not occur at NAVSTA Mayport. High-level maintenance on fleet CVNs on the East Coast currently occurs in the Norfolk, Virginia area.

2.6.2.3 Use of Existing Command and Control Facilities

As an active naval station supporting fleet operations, NAVSTA Mayport has extensive command and control facilities to continue such support. NAVSTA Mayport is the CLASSRON headquarters for all frigates in the Navy and is home to three DESRONs and the ATG, which supports Commanding Officers' training teams in maintaining in-ship Sailor readiness. Existing command and control facilities would be utilized to support all 12 alternatives. Alternatives involving CRU/DES homeporting or ARG homeporting (Alternatives 1, 5, 6, 7, 8, 11, and 12) also involve location of a DESRON or PHIBRON command staff at NAVSTA Mayport, which would require new facility construction. None of the other alternatives require location of squadron or strike group command staffs to NAVSTA Mayport.

2.6.2.4 Use of Existing Military Personnel Support Facilities

As an active naval station supporting fleet operations, NAVSTA Mayport has extensive military personnel support facilities. At its peak, NAVSTA Mayport supported more than 18,000 personnel. Existing facilities are adequate to support all Group 1 and Group 2 alternatives as all of those alternatives result in a net loss of personnel compared to the 2006 baseline year. Group 3 Alternative 10 would result in essentially the same net daily population as the baseline and Group 3 Alternative 12 would result in a net gain in personnel and would stress capacity of the physical fitness center and chapel/religious education center. The current deficit in bachelor housing of E1-E3 ranks will be addressed by a Public-Private Venture (PPV) initiative. Any additional bachelor quarters requirements associated with Group 1, 2, or 3 alternatives would likewise be addressed by future PPV initiatives.

2.6.3 EFFICIENT USE OF WATERSIDE FACILITIES/BERTHS

Berthing capacity discussed below is based on NAVFAC planning criteria for port loading (NAVFAC 2005) as adjusted per the FRP to be calculated using a 73 percent deployment factor, which means for planning purposes, port loading assumes each deployable ship is in port 73 percent of the time, as previously discussed in Section 2.1.

2.6.3.1 Access to Berths

NAVSTA Mayport provides 16 berths along Wharves A through F, ranging in depth from -35 ft to -50 ft MLLW. These depths are adequate for berthing all non-CVN ship types proposed in all alternatives. However, access to berths for all ship loading conditions is restricted for CVNs under all Group 2 and 3 alternatives, necessitating dredging the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel to a required depth of -50 ft MLLW (plus an additional 2 ft for advance maintenance (where necessary for fast-shoaling areas) and 2 ft for allowable over depth for a maximum total of -54 ft MLLW). The -50 ft depth would provide the required minimum 6 ft clearance under keel, allowing unrestricted access to CVNs under all ship loading and tidal conditions. No new work dredging is required for any Group 1 alternatives or for any non-CVN ships proposed for homeporting.

2.6.3.2 Availability of Berth C-1 as weapons handling area; Availability of Wharf E and Wharf F as primary maintenance wharves; Compliance with harbor operations/nesting requirements

These criteria are discussed together, because together, they represent the optimal capacity of NAVSTA Mayport harbor to accommodate homeported and visiting ships without constructing new berths or requiring significant harbor management efforts. The stated criteria are:

- Availability of Berth C-1 as the primary weapons handling berth. Use of this berth for weapons handling impacts the least number of inhabited buildings, affords easy channel access, and accommodates increased weapons handling requirements at NAVSTA Mayport. Unencumbered access to this berth should be maintained to the fullest extent possible. This would also allow for potential use of this berth to support occasional ship dispersal or transient ship requirements.

- Availability of Wharves E and F as primary maintenance berths. Ships should not be nested in berths F-1, F-2, E-1, E-2 and E-3. Ships are berthed here for an extended period of time for maintenance availabilities, and nesting results in a loss of ship repair capacity. (For CVN homeporting alternatives, Wharf F [Berths F-1 and F-2] and Berth E-1 should be available for CVN maintenance.)

- Compliance with harbor operations/nesting requirements. No more than two ships should be nested together elsewhere (Wharves A, B, C, and D). While nesting of certain ships three abreast is feasible, this is not an optimal situation due to the associated impact on operations and logistics within the port. The following ship types can be nested together: CG & CG; DDG & DDG; FFG & FFG; CG & FFG; DDG & FFG. Nesting is not authorized if winds are expected to be 50 knots or greater.

Evaluating all three criteria together is necessary to determine whether all homeported ships (existing and proposed) can be optimally berthed at NAVSTA Mayport. Considering both the earliest possible dates of arrival of additional ships proposed for homeporting and the decommissioning schedules of ships currently homeported at NAVSTA Mayport, ship berthing configurations were evaluated for compliance with the stated criteria. The earliest possible dates of arrival for all ships is assumed 2009 following signature of a Record of Decision, except for the CVN which could not be homeported until requisite dredging projects are completed (2012 earliest) and CVN nuclear propulsion plant maintenance facilities are completed (2014 earliest). Likewise, the earliest possible date of arrival of visiting CVNs under the Group 2 alternative would be 2012. Using the earliest possible dates for this analysis creates a "worst case" scenario for personnel and ship loading at NAVSTA Mayport because it would homeport additional ships earlier in relation to scheduled FFG decommissioning, resulting in higher annual ship loading in earlier years and tighter ship berthing configurations. Implementing any of the alternatives later than the "earliest" dates would alleviate any harbor operations concerns regarding these criteria.

2.6.4 ALTERNATIVES CARRIED FORWARD FOR DETAILED ANALYSIS

All alternatives meet the stated criteria, assuming earliest possible arrival dates, except for Alternatives 6, 11, and 12. Alternative 6, CRU/DES and LHD homeporting (four DDGs/one FFG and two LHDs) results in nesting 3 abreast, unless one of the proposed LHDs or the CRU/DES arrival date is delayed until 2012. Alternative 11, which is the same as Alternative 6 with the addition of CVN capable also results in nesting 3 abreast, but would meet the criteria in 2012 when the CVN is not visiting or 2013 completely. Alternative 12, CRU/DES, LHD, and CVN homeporting likewise would not meet the criteria unless one of the proposed LHDs or the CRU/DES arrival date is delayed until 2012. In any case, all alternatives could be implemented during the years between 2009 and the 2014 end state year without violating the stated criteria by delaying some arrival dates; relaxation of the criteria would be required to implement all alternatives at the earliest possible dates assumed above.

The Navy has concluded that all alternatives are feasible and, therefore, it is appropriate to carry all 12 action alternatives, plus the No Action Alternative, forward for detailed analysis. Table 2.6-1 summarizes the comparison of alternatives and evaluation criteria.

Table 2.6-1 Capability of Each Alternative to Meet Purpose and Need

		Use of Available Facilities to Minimize Construction				**Efficient Use of Waterside Facilities/Berths**			
	Effective support of fleet operations	Use of existing pierside utilities	Use of existing maintenance and repair facilities	Use of existing command and control facilities	Use of existing military personnel support facilities	Access to berths	Availability of Berth C-1 as weapons handling area	Availability of Wharf E and Wharf F as primary maintenance wharves	Compliance with harbor operations/nesting restrictions
Group 1 – Alternatives Involving Homeporting of Surface Ships (Non-CVN)									
Alt 1: CRU/DES Homeporting	○	○	○	◒	○	○	○	○	○
Alt 2: LHD Homeporting	○	○	○	○	○	○	○	○	○
Alt 5: ARG Homeporting	○	○	○	◒	○	○	○	○	○
Alt 6: CRU/DES Homeporting and LHD Homeporting	○	○	○	◒	○	○	○	○	◒
Group 2 – Alternatives Involving Dredging for Unrestricted CVN Capability									
Alt 3: CVN Capable	○	○	○	○	○	◒	○	○	○
Alt 7: CRU/DES Homeporting and CVN Capable	○	○	○	◒	○	◒	○	○	○
Alt 9: LHD Homeporting and CVN Capable	○	○	○	○	○	◒	○	○	○
Alt 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable	○	○	○	◒	○	◒	○	○	◒
Group 3 – Alternatives Involving Homeporting of a CVN									
Alt 4: CVN Homeporting	◒	◒	◒	◒	○	◒	○	○	○
Alt 8: CRU/DES Homeporting and CVN Homeporting	◒	◒	◒	◒	◒	◒	○	○	○
Alt 10: LHD Homeporting and CVN Homeporting	◒	◒	◒	◒	◒	◒	○	○	○
Alt 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting	◒	◒	◒	◒	◒	◒	○	○	◒

○ = Meets criteria with no constraints

◒ = Meets criteria with moderate constraints to overcome

● = Does not meet criteria/Constraints too severe to overcome

2.7 COMPARISON OF ALTERNATIVES

Chapters 4, 5, and 6 provide detailed analysis of environmental impacts of all 12 action alternatives and the No Action Alternative. Table 2.7-1 summarizes construction requirements and Table 2.7-2 (at the end of this chapter) provides a summary of environmental consequences of the alternatives analyzed in this FEIS by resource area. For further details, see the analysis provided in Chapters 4, 5, and 6 of this FEIS.

Table 2.7-1 Summary of Construction Requirements by Alternative

	Land Construction					
	Headquarters Facility	Transportation Improvements	Parking Structures	Wharf F Improvements	CIF/SMF/ MSF	**Dredging Project**
Group 1 – Alternatives Involving Homeporting of Surface Ships (Non-CVN)						
Alt 1	0.5 ac	-	-	-	-	-
Alt 2	-	-	-	-	-	-
Alt 5	0.5 ac	-	-	-	-	-
Alt 6	0.5 ac	-	-	-	-	-
Group 2 – Alternatives Involving Dredging for Unrestricted CVN Capability						
Alt 3	-	-	-	-	-	5.2 million cy
Alt 7	0.5 ac	-	-	-	-	5.2 million cy
Alt 9	-	-	-	-	-	5.2 million cy
Alt 11	0.5 ac	-	-	-	-	5.2 million cy
Group 3 – Alternatives Involving Homeporting of a CVN						
Alt 4	-	Massey Road corridor widening and six intersection improvements (12 ac)	one 3-story (3 ac)	shore power utility systems, reinforced concrete crane pad, and Type III heavy weather moorings	15 ac	5.2 million cy
Alt 8	0.5 ac		one 4-story (3 ac)		15 ac	5.2 million cy
Alt 10	-		one 5-story (3 ac)		15 ac	5.2 million cy
Alt 12	0.5 ac		one 5-story (3 ac); one 4-story (1 ac)		15 ac	5.2 million cy
No Action Alternative						
Alt 13 No Action	-	-	-	-	-	-

2.8 PREFERRED ALTERNATIVE

This EIS analyzes 12 action alternatives and the No Action Alternative. Based on a thorough review of the alternatives, the Department of the Navy has determined Alternative 4 to be its Preferred Alternative. Alternative 4 involves homeporting one CVN, dredging, infrastructure and wharf improvements, and construction of CVN nuclear propulsion plant maintenance facilities. Factors that influenced selection of Alternative 4 as the Preferred Alternative included impact analysis in the EIS, estimated costs of implementation, including military construction and other operation and sustainment costs, and strategic dispersal considerations. Homeporting a CVN at NAVSTA Mayport would enhance distribution of CVN homeport locations to reduce risks to fleet resources in the event of natural disaster, manmade calamity, or attack by foreign nations or terrorists. This includes risks to aircraft carriers, industrial support facilities, and the people that operate and maintain those crucial assets.

The aircraft carriers of the United States Navy are vital strategic assets that serve our national interests in both peace and war. The President calls upon them for their unique ability to provide both deterrence and combat support in times of crisis. Of the 11 aircraft carriers currently in service, five are assigned to the Atlantic Fleet. Utilizing the capacity at NAVSTA Mayport to homeport a CVN disperses critical Atlantic Fleet assets to reduce risks, thereby enhancing operational readiness. Operational readiness is fundamental to the Navy's mission and obligation to the Commander in Chief.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Earth Resources	Group 1	1	Disturbance of 0.5-acre of soil and modification of topography associated with construction of headquarters facility; impacts would be localized at development site and minimized with implementation of Best Management Practices (e.g., use of silt fencing, gravel construction entrance, etc.) as well as adherence to FDEP Environmental Resource Permit conditions; no impacts to marine sediments.
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	The dredging of the NAVSTA Mayport turning basin and entrance channel, and Jacksonville Harbor Cut 3 of the federal navigation channel to -54 ft MLLW would generate approximately 5.2 million cy of dredged material. Effects to earth resources are assessed in the following categories: <u>Dredging – physical effects on sediment and benthos</u>: Removal of sediment would have a long-term physical impact to the affected substrate; effects would be localized to the dredge sites. Changes in sediment disposition are addressed under water resources section since they were evaluated along with other hydrological impacts. Smaller benthic organisms that would not flee during dredging may not survive dredging; re-colonization of the affected area by benthic organisms would occur over time at a rate dependent on various abiotic and biotic factors that would remain largely unchanged by the dredging activity. <u>Ocean disposal – physical effects on sediment and benthos</u>: Disposal of sediments at the ODMDS would result in burial of some marine organisms, resulting in mortality to some; impacts would be localized to the ODMDS and temporary in nature. Disposal would be subject to MPRSA Section 103, requiring verification by USACE and USEPA that the materials are suitable for ocean disposal. <u>Ocean disposal – effects on ODMDS capacity</u>: Disposal of approximately 5.2 million cy of material would require approximately 55 percent of the remaining capacity of the Jacksonville ODMDS or 8 percent of the remaining capacity of the Fernandina ODMDS If all material is placed at the Jacksonville ODMDS, approval for a one-time disposal in excess of the existing 2 million cy temporary annual disposal limit would be required and the remaining capacity of the ODMDS would likely be depleted within a few years due to material generated from NAVSTA Mayport and federal navigation maintenance dredging. The Navy is currently supporting USACE and USEPA efforts to re-evaluate the remaining capacity at the Jacksonville ODMDS to determine whether planning for additional or expanded capacity for ocean disposal in the region is needed. The impacts to limited capacity of the Jacksonville ODMDS would be minimized over a reasonable planning period by splitting the placement of the dredged material from the proposed deepening project with approximately 2 million cy going to Jacksonville ODMDS and the remainder (3.2 million cy) going to Fernandina ODMDS.
		7	Same impacts as Alternative 3, except additional disturbance of 0.5-acre of soil and modification of topography associated with construction of headquarters facility; impacts would be minimal and localized at development site and minimized with implementation of Best Management Practices (e.g., use of silt fencing, gravel construction entrance, etc.) as well as adherence to FDEP Environmental Resource Permit conditions.
		9	Same impacts as Alternative 3.
		11	Same as Alternative 7.
	Group 3	4	Same as Alternative 3, plus approximately 30 to 32 acres of soils would be disturbed and topography modified for construction of nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements at NAVSTA Mayport. Impacts would be minimized through erosion and pollution control procedures prescribed by the required Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems.
		8	Same impacts as Alternative 4.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 4.
	No Action		No impacts expected.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Land and Offshore Use	Group 1	1	On-Station: Localized impacts in conversion of NAVSTA Mayport land use with construction of headquarters facility in existing vacant lot used intermittently as a contractor laydown area. Off-Station: Indirect impacts to off-Station land uses in the vicinity of NAVSTA Mayport due to the approximate 2,800 decrease in net daily population and dependent population and reduced influence on commercial business, community housing, and recreation. With revitalization efforts in the area, there would likely be changes to the types of commercial and residential uses within their current distribution footprint. Offshore Use: No impacts to commercial or recreational fisheries. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the Florida Coastal Management Program (FCMP).
		2	On-Station: No impacts expected. Off-Station: Same impacts as described for Alternative 1, except the magnitude would be reduced since there is an approximate 2,300 decrease in net daily population under Alternative 2. Offshore Use: No impacts to commercial or recreational fisheries. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the FCMP.
		5	Same impacts as Alternative 1, except the magnitude of off-Station impacts would be less as the net daily population is expected to decrease by approximately 2,600 under Alternative 5.
		6	Same impacts as Alternative 1, except the magnitude of off-Station impacts would be less as the net daily population is expected to decrease by approximately 1,200 under Alternative 6.
	Group 2	3	On-Station: No impacts expected. Off-Station: Same as described for Alternative 1, except the magnitude of the impacts would be greater as the net daily population is expected to decrease by approximately 3,900 under Alternative 3. Offshore Use: Dredging would create localized, short-term impacts on commercial and sports fishing due to increased sedimentation levels. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the FCMP.
		7	Same impacts as Alternative 1, plus localized, short-term impacts on commercial and sport fishing due to dredging.
		9	Same impacts as Alternative 2.
		11	Same impacts as Alternative 6.
	Group 3	4	On-Station: Construction of nuclear propulsion plant maintenance facilities, parking facilities, and transportation improvements at NAVSTA Mayport would result in conversions of 15 acres of land designated as "logistics" to "maintenance" that would be compatible with existing land use. The widening of Massey Road (on NAVSTA Mayport) would lessen setbacks between the road and occupied structures, which needs to be considered in terms of antiterrorism/force protection requirements. Off-Station: Same as Alternative 1, except the magnitude of impacts would be less as the net daily population is expected to decrease by approximately 1,600 under Alternative 4. Offshore Use: Dredging impacts to fishing would be the same as Alternative 3. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the FCMP.
		8	Same impacts as Alternative 4, except also includes on-Station impacts related to the construction of headquarters facility as assessed in Alternative 1 and the magnitude of off-Station impacts would be negated as the net daily population is expected to decrease by approximately 430 under Alternative 8.
		10	On-Station: With regard to new construction, same as Alternative 4. Net daily population remains essentially the same and not expected to result in changes to baseline land use conditions. Off-Station: No notable change from baseline conditions. Offshore Use: Dredging impacts to fishing would be the same as Alternative 3. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the FCMP.
		12	On-Station: Same impacts as Alternative 10, except also includes on-Station impacts related to the construction of headquarters facility as assessed in Alternative 1 and the magnitude of the impact would be greater as the net daily base population is expected to increase by approximately 1,200. Off-Station: Indirect impacts related to the increased population at NAVSTA Mayport could include small-scale changes to commercial, industrial, and residential land uses in the area that, in concert with area revitalization efforts, could result in increased density of development and higher demand on recreation areas. Offshore Use: Dredging impacts to fishing would be the same as Alternative 3. Coastal Zone: The action would be compatible with local land use plans and consistent to the maximum extent practicable with the enforceable policies of the FCMP.
	No Action		On-Station: If facility utilization were consolidated to improve space utilization, there could be changes in land use patterns on NAVSTA Mayport. Off-Station: Indirect impacts to off-Station land uses in the vicinity of NAVSTA Mayport due to the approximate 3,900 decrease in net daily population and dependent population and reduced influence on commercial business, community housing, and recreation. With revitalization efforts in the area, there would likely be changes to the types of commercial and residential uses within their current distribution footprint. Offshore Use: No impacts expected. Coastal Zone: No impacts expected.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Water Resources	Group 1	1	Groundwater: Increased impervious surface at 0.5-acre headquarters facility construction site would cause slight decrease in infiltration of precipitation. Surface Water: Localized impacts to stormwater flow at 0.5-acre headquarters facility construction site that would require an Environmental Resource Permit. No new stormwater outfalls would be needed to support this new construction. Wetlands and Floodplains: No impacts expected.
		2	No impacts expected.
		5	Same impacts as Alternative 1
		6	Same impacts as Alternative 1
	Group 2	3	Groundwater: Dredging would not impact groundwater as the Floridan aquifer would not be breached and controls on upland disposal of dredged material (if it occurs) would be at existing, approved upland sites that hold FDEP permits that address controls to ensure no impact to groundwater. Surface Water: Surface Water – New Construction: Same impacts as Alternative 1. Surface Water – Dredging Activities: Dredging activities would have short-term and localized impacts to surface water quality from suspended sediment and potential release of chemical burden of sediment to the water column. Hydrodynamic model results indicate that, following the cessation of dredging activities, evidence of suspended sediment would: (1) rapidly disappear within an hour and would totally disappear within four hours of clamshell dredge use in the within the NAVSTA Mayport turning basin, and (2) would totally disappear within one hour of hopper dredge use within the NAVSTA Mayport entrance channel and federal navigation channel. One elutriate analysis conducted in the NAVSTA Mayport turning basin. Seven dissolved metals were detected in the dredge elutriate; most detected metals were below State Class III water quality standards, but arsenic levels were measured at 131 micrograms per liter (µg/l) (the Florida Class III water quality standard is 50 µg/l), mercury was measured at 30 µg/l (the Florida Class III water quality standard is 0.025 µg/l), and lead was measured at 26 µg/l (the Florida Class III water quality standard is 8.5 µg/l. Hydrodynamic model results indicate that the concentrations of mercury and lead sediment released in the water column during dredging would disperse within a short distance of the dredging action. Given the higher relative concentrations of arsenic, the dispersion would extend further, but at relatively low concentration (most of the dispersion would be at levels ranging 0.1 µg/l to 0.5 µg/l). Further elutriate analysis is being conducted during the permitting phase of the project. After publication of the DEIS (in Spring 2008), additional elutriate testing of the sediment to be dredged was performed as part of the more intensive, site specific Marine Protection, Research, and Sanctuaries Act Section 103 Evaluation required for the permitting phase of the dredge project. Sediment samples were collected from the dredge project area (including at the same location as the sample taken for the DEIS analysis presented in the preceding paragraph) and analyzed for metals, polychlorinated biphenyls, pesticides, and polycyclic aromatic hydrocarbons. These parameters were found to be well below the Florida Class III surface water quality standards in all sediment samples within the dredge project area. These results suggest that the high levels of exceedance of Florida Class III surface water quality standards for arsenic, mercury, and lead in the sample collected for the DEIS analysis were an anomaly. Hydrodynamic model results show that currents, salinity levels, and sedimentation rates in the NAVSTA Mayport turning basin, entrance channel, federal navigation channel, and St. Johns River would not change significantly from existing conditions following the proposed dredging project. Changes in salinity of water were modeled for the surface and river bottom of the St. Johns River. Bottom salinity is of concern and commonly measured for change because of the organisms that inhabit such benthic environments. During low river flow, the model predicted a small decrease in bottom salinity and a slight increase in surface salinity in river mile 0 to river mile 4 during neap tides as a result of dredging. Salinity at mid-depth during neap tides and at all depths during spring tides was predicted not to change. During high river flow, the model predicted a small decrease in salinity at the bottom and mid-depth of the river and a slight increase at the surface in river mile 0 to river mile 12 during a spring tide and from river mile 0 to river mile 8 during a neap tide as a result of the proposed dredging. Annual sedimentation disposition volumes would increase by 2 percent within the NAVSTA Mayport turning basin, 7 percent within the NAVSTA Mayport entrance channel, and 2 percent within the federal navigation channel. Wetlands and Floodplains: No impacts expected.
		7	Same impacts as Alternative 3, plus same impacts as Alternative 1 associated with construction of headquarters facility.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Groundwater: Increased impervious surface for 30-32 acres of development for nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements would cause minor decrease in infiltration of precipitation that would be addressed in stormwater management, which would likely include detention or retention basins that would allow for recharge to the aquifer systems. Groundwater from the surficial aquifer may be encountered during site preparation activities (i.e., grading and excavation), but potential impacts would be addressed with adherence to construction National Pollutant Discharge Elimination System (NPDES) permit requirements, dewatering practices, and modified construction techniques. Surface Water – New Construction: Localized impact to stormwater flow from 30-32 acres of construction that would require a construction site Stormwater Pollution Prevention Plan (SWPPP) and Environmental Resource Permit, modification of the NAVSTA Mayport Multi-Sector General Permit SWPPP to address new industrial activities, and possibly modification of the management and plans of NAVSTA Mayport's Municipal Separate Storm Sewer Systems (MS4) permit. New impervious discharge would have to be evaluated and mitigation implemented to prevent additional nutrients from entering receiving waters. No new stormwater outfalls would be needed to support this new construction. Surface Water – Dredging Activities: Same impacts as described for Alternative 3. Wetlands and Floodplains: Facilities would not be constructed within the 100-year floodplain; however, the outward fringes of the area of potential development for the nuclear propulsion plant maintenance facilities and portions of a road widening are within the 100-year floodplain. Massey Road/Bon Homme Richard Street intersection improvements are adjacent to a ditch that empties into a jurisdictional wetland. Impacts to this jurisdictional wetland would likely be avoided during the design phase and, if not, would be mitigated.
		8	Same impacts as Alternative 4, plus impacts associated with headquarters facility described for Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.
	No Action		No impacts expected.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Air Quality	Group 1	1	Construction and operational air emission increases due to the construction of the headquarters facility; the greatest increase would be in particulate matter with a diameter less than 10 microns (PM_{10}) emissions that would occur during construction (0.21 tons per year in 2011 and 0.00 tons per year in 2012). There would be a reduction in commuter emissions commensurate with the decrease in personnel.
		2	No impacts expected.
		5	Construction and operational air emission increases due to the construction of the headquarters facility; the greatest increase would be in particulate matter with a diameter less than 10 microns (PM_{10}) emissions that would occur during construction (0.27 tons per year in 2011 and 0.01 tons per year in 2012). There would be a reduction in commuter emissions commensurate with the decrease in personnel.
		6	Same impacts as Alternative 1.
	Group 2	3	Short-term increase in air emissions due to use of dredging equipment and tug engines used in transport of dredged materials to the ODMDS. The maximum construction emissions represent a small fraction of the Duval County emissions, with oxides of nitrogen (NO_x) providing the largest contribution in 2011 of 194 tons (or approximately 0.26 percent). There would be a reduction in commuter emissions commensurate with the decrease in personnel under this alternative, and there would be minor vehicle emissions associated with Sailors obtaining rental cars when the visiting CVN is in port.
		7	Same impacts as Alternative 3, plus includes minimal construction and operational air emission increases due to the construction of the headquarters facility as described for Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same impacts as Alternative 3, plus includes emissions associated with construction and operation of nuclear propulsion plant maintenance facilities, resulting in maximum construction emissions with NO_x providing the largest contribution in 2011 of 197 tons (or approximately 0.26 percent of the Duval County NO_x emissions).
		8	Same impacts as Alternative 4, except emissions would be minimally higher due to construction of headquarters facility as described for Alternative 1 (NO_x of 199 tons in 2011).
		10	Same impacts as Alternative 4, except commuter emissions are expected to increase commensurate with the increase in personnel (NO_x of 198 tons in 2011).
		12	Same impacts as Alternative 8, except commuter emissions are expected to increase commensurate with the increase in personnel (NO_x of 199 tons in 2011).
	No Action		There would be a reduction in commuter emissions commensurate with the decrease in personnel.
Noise	Group 1	1	There would be a short-term increase in noise levels related from land-based construction of headquarters facility in the vicinity of the NAVSTA Mayport Medical and Dental Clinic (typically considered a sensitive noise receptor, but sensitivity reduced in that clinic does not provide overnight care).
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	A short-term increase in noise levels related to dredging activities is expected to affect sensitive noise receptors within 2,000 ft of dredging activities (i.e., the NAVSTA Mayport Pelican Roost recreational vehicle park and bachelor housing and the City of Jacksonville Huguenot Park). Noise levels not expected to exceed levels regulated by City of Jacksonville or otherwise considered significant.
		7	Same impacts as Alternative 3, plus impacts assessed with Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same impacts as Alternative 3, plus Massey Road widening project would potentially affect the following NAVSTA Mayport sensitive noise receptors: Chapel and Medical and Dental Clinic (typically considered a sensitive noise receptor, but sensitivity reduced in that clinic does not provide overnight care).
		8	Same impacts as Alternative 4, plus impacts assessed with Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.
	No Action		No impacts expected.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Biological Resources	Group 1	1	Vegetation removal in landscaped and previously disturbed areas and temporary displacement of wildlife in suitable habitat within the 0.5-acre headquarters facility construction area (no sensitive vegetation and wildlife species occur at the site). No impacts to marine communities, marine fish, essential fish habitat, federally threatened or endangered species, or marine mammals.
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	Marine Communities (Marine Flora and Invertebrates): Short-term impacts from dredging activities to marine flora and invertebrates in the vicinity of the dredging areas and ODMDS. Marine Fish and EFH: The proposed dredge project is located within the vicinity of designated EFH for 21 Fishery Management Units (FMUs) but none occur in the vicinity of the ODMDSs. Habitat Areas of Particular Concern designated for four of these FMUs (managed by the South Atlantic Fishery Management Council) occur within the vicinity of the proposed dredging activities. Dredging activities would be expected to result in fish temporarily avoiding the area and potential entrainment of larval stages of fish species at a level that would not significantly impact larval populations. Terrestrial Communities: No impacts expected. Federally Threatened and Endangered Species: In accordance with section 7 of the Endangered Species Act (ESA), the Navy is in consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) regarding potential impacts to federally listed species and designated critical habitat. To support ESA consultation, Navy and USACE, as a co-consulter, have prepared separate Biological Assessments (BAs) for NMFS and USFWS to address potential impacts to those federally listed species under their respective jurisdiction (Appendix B.3). The Navy has determined that, with implementation of protective measures, implementation of the dredge project may affect, but is not likely to adversely affect North Atlantic right whales, humpback whales, or Florida manatee and would not destroy or adversely modify North Atlantic right whale or Florida manatee designated critical habitat. The Navy has found that, with implementation of protective measures, the use of a mechanical and/or cutterhead dredge may affect, but is not likely to adversely affect listed sea turtles; the use of a hopper dredge may adversely affect listed sea turtles; and bed-leveling activities in association with dredging operations may affect, but are not likely to adversely affect sea turtles. There would be no effect on nesting listed sea turtles. The Navy and USACE anticipate similar terms and conditions to those identified in existing relevant Biological Opinions (BOs) for similar dredging activities to be identified in the NMFS BO for the proposed action. Navy and USACE dredging activities currently comply with such terms and conditions. The Letter of Concurrence from USFWS and the BO from NMFS will be obtained prior to issuance of the Record of Decision for this FEIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision. Marine Mammals: Potential impacts to marine mammals resulting from dredge activities would be similar to those for special status species. Coastal bottlenose dolphin are common in the dredge area; although these dolphin are sensitive to noise in some of the frequencies that would be generated from dredge activities, dolphin are highly mobile and would only be in the vicinity of dredge operations for short periods of time. No injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed are expected.
		7	Same impacts as Alternative 3, plus impacts assessed with Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same impacts as Alternative 3, plus construction of the nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements would have localized impacts to include vegetation removal in landscaped and previously disturbed areas and temporary displacement of wildlife in suitable habitat within the 30-32 acre construction areas (no sensitive vegetation or wildlife species occur at these sites). In-water construction activities associated with the installation of the Type III heavy weather moorings at Wharf F would require approximately one hour of pile driving. No injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed are expected.
		8	Same impacts as Alternative 4, plus impacts assessed with Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.
	No Action		No impacts expected.
Cultural Resources	Group 1	1	Construction of a headquarters building would occur in previously disturbed areas the Station. No known historic properties would be affected directly or indirectly. However, as an additional safeguard, the Navy will attach a post-review discovery clause to the contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery. The Navy consulted with the Florida State Historic Preservation Officer (SHPO) under Section 106 of the National Historic Preservation Act to confirm that appropriate actions will be taken to ensure that historic properties will not be adversely affected in the course of this project undertaking (Appendix E.1).
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	No known historic properties would be affected by dredging activities. The Navy completed a remote sensing survey of the portions of the NAVSTA Mayport entrance channel and federal navigation channel to be dredged that identified no survey targets having magnetic signatures suggestive of cultural resources within the proposed dredging prism. Two underwater survey targets suggestive of cultural resources were identified within 100 feet of the existing federal navigation channel. While outside the proposed dredging area, the Navy conducted an underwater intensive-level survey of these targets and determined that they did not qualify for inclusion in the National Register of Historic Places (NRHP)]. The Navy consulted with the Florida SHPO under Section 106 of the National Historic Preservation Act to confirm that appropriate actions will be taken to ensure that historic properties will not be adversely affected in the course of this project undertaking (Appendix E.1).
		7	Same impacts as Alternative 3, plus includes the impacts assessed for Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same impacts as Alternative 3. Also little potential to impact historic properties as a result of the construction of CVN homeporting related infrastructure, as construction would occur in previously disturbed, built areas, with no historic properties in areas of potential effects. As additional safeguard, an archaeological monitor will be present to ensure that any newly discovered cultural resources are taken into account and to confirm that NRHP-eligible prehistoric archaeological site (8DU7458) located near the Massey Avenue/Maine Street intersection improvement area is avoided. The Navy consulted with the Florida SHPO under Section 106 of the National Historic Preservation Act to confirm that appropriate actions will be taken to ensure that historic properties will not be adversely affected in the course of this project undertaking (Appendix E.1).
		8	Same impacts as Alternative 4, plus includes the impacts assessed for Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
	No Action		No impacts expected.
Traffic	Group 1	1	Localized, short-term on-Station impacts to traffic from rerouting traffic and construction vehicles associated with construction of headquarters facility.
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	Barge trips required for the transport of dredged material to the ODMDS would temporarily increase marine vessel traffic (approximately 2,000 to 6,000 vessel trips to/from the ODMDSs, depending on barge size), but would represent a small fraction of the total approximately 81,000 annual vessel movements (i.e., include inbound and outbound trips, including the St. Johns River Ferry) within the Jacksonville Harbor.
		7	Same impacts as Alternative 3, plus impacts described for Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same impacts as Alternative 3, plus construction of nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements would be expected to have localized, short-term on-Station impacts to traffic associated with construction vehicles, rerouting of traffic, and temporary displacement of parking.
		8	Same impacts as Alternative 4, plus includes impacts assessed with Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 4, except that the net daily population is expected to increase by 9 percent resulting in 2,081 (approximately 2,100) additional vehicle trips per day. Off-Station impacts would range from 2.1 percent to 14.9 percent. Level of Service analysis showed that Alternative 12 would have minimal impact on the level of service for the study area roadway segments, and that all of the roadway segments except for the southern area of Mayport Road near Atlantic Boulevard would be expected to operate at an acceptable level of service (Level “C” or better).
	No Action		No impacts expected.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
Socioeconomics	Group 1	1	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -24 percent and total school age children would be reduced by 23 percent. The estimated construction impacts would total approximately $5 million and result in 53 full- and part-time jobs. The average annual growth in direct jobs would be -3.8 percent, total change in employment would be approximately -3,500 jobs, direct payroll would be reduced by $260 million, and change in disposable income would be reduced by a total of $246 million. Estimated local tax contributions would be reduced by approximately $11 million.
		2	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -20 percent and total school age children would be reduced by 19 percent. There would be no construction impacts. The average annual growth in direct jobs would be -3.2 percent, total change in employment would be approximately -2,900 jobs, direct payroll would be reduced by $220 million, and change in disposable income would be reduced by a total of $208 million. Estimated local tax contributions would be reduced by approximately $9 million.
		5	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -23 percent and total school age children would be reduced by 21 percent. The estimated construction impacts would total approximately $7 million and result in 70 full- and part-time jobs. The average annual growth in direct jobs would be -3.5 percent, total change in employment would be approximately -3,200 jobs, direct payroll would be reduced by $242 million, and change in disposable income would be reduced by a total of $229 million. Estimated local tax contributions would be reduced by approximately $10 million.
		6	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -10 percent and total school age children would be reduced by 9 percent. The estimated construction impacts would total approximately $5 million and result in 53 full- and part-time jobs. The average annual growth in direct jobs would be -1.5 percent, total change in employment would be approximately -1,500 jobs, direct payroll would be reduced by $110 million, and change in disposable income would be reduced by a total of $104 million. Estimated local tax contributions would be reduced by approximately $5 million.
	Group 2	3	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -35 percent and total school age children would be reduced by 32 percent. The estimated construction impacts would total approximately $80 million and result in 810 full- and part-time jobs. The average annual growth in direct jobs would be -5.7 percent, total change in employment would be approximately -4,900 jobs, direct payroll would be reduced by $370 million, and change in disposable income would be reduced by a total of $350 million. Estimated local tax contributions would be reduced by approximately $16 million.
		7	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -24 percent and total school age children would be reduced by 23 percent. The estimated construction impacts would total approximately $85 million and result in 860 full- and part-time jobs. The average annual growth in direct jobs would be -3.8 percent, total change in employment would be approximately -3,500 jobs, direct payroll would be reduced by $260 million, and change in disposable income would be reduced by a total of $246 million. Estimated local tax contributions would be reduced by approximately $11 million.
		9	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -20 percent and total school age children would be reduced by 19 percent. The estimated construction impacts would total approximately $80 million and result in 810 full- and part-time jobs. The average annual growth in direct jobs would be -3.2 percent, total change in employment would be approximately -2,900 jobs, direct payroll would be reduced by $220 million, and change in disposable income would be reduced by a total of $208 million. Estimated local tax contributions would be reduced by approximately $9 million.
		11	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -10 percent and total school age children would be reduced by 9 percent. The estimated construction impacts would total approximately $85 million and result in 860 full- and part-time jobs. The average annual growth in direct jobs would be -1.5 percent, total change in employment would be approximately -1,500 jobs, direct payroll would be reduced by $110 million, and change in disposable income would be reduced by a total of $104 million. Estimated local tax contributions would be reduced by approximately $5 million.
	Group 3	4	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be -13 percent and total school age children would be reduced by 12 percent. The estimated construction impacts would total approximately $671 million and result in 7,400 full- and part-time jobs. The average annual growth in direct jobs would be -2.1 percent, total change in employment would be approximately -2,000 jobs, direct payroll would be reduced by $150 million, and change in disposable income would be reduced by a total of $141 million. Estimated local tax contributions would be reduced by approximately $6 million.
		8	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. There would be a minimal decrease in on- and off-Station housing demand and occupancy rate from a decrease in base personnel. The percent change for total dependents would be -3 percent and total school age children would be reduced by 3 percent The estimated construction impacts would total approximately $700 million and result in approximately 7,700 full- and part-time jobs. The average annual growth in direct jobs would be -0.5 percent, total change in employment would be -530 jobs, direct payroll would be reduced by $40 million, and change in disposable income would be reduced by a total of $38 million. Estimated local tax contributions would be reduced by approximately $1 million.
		10	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. There would be no change in housing demand since Station population would remain relatively unchanged. The percent change for total dependents would be 1 percent and total school age children would increase by 1 percent. The estimated construction impacts would total approximately $701 million and result in approximately 7,700 full- and part-time jobs. The average annual growth in direct jobs would be flat, total change in employment would be 6 jobs, direct payroll would increase by approximately $1 million, and change in disposable income would increase by $0.1 million. Estimated local tax contributions would increase by approximately $1 million.
		12	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would increase resulting in an increase in on- and off-Station housing demand and occupancy rate. The percent change for total dependents would be 12 percent and total school age children would be increased by 11 percent. The estimated construction impacts would total approximately $722 million and result in approximately 7,900 full- and part-time jobs. The average annual growth in direct jobs would be 1.4 percent, total change in employment would be an increase of 1,500 jobs, direct payroll would be increased by $110 million, and change in disposable income would be increased by a total of $104 million. Estimated local tax contributions would increase by approximately $6 million.
	No Action		Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. The Station population would decrease resulting in a decrease in on- and off-Station housing demand and occupancy rate. It is anticipated that the percent change for total dependents would be -35 percent, total school age children would decrease by 32 percent, average annual growth in direct jobs would be -5.7 percent, total change in employment would be approximately -4,900 jobs, direct payroll would be reduced by $370 million, and change in disposable income would be reduced by a total of $349 million. Estimated local tax contributions would decrease by approximately $16 million.

Table 2.7-2 Comparison of Alternative Impacts

Resource	Alternative		Potential Impacts/Effects
General Services (law enforcement, emergency services, health services, recreation, family services, childcare, education)	Group 1	1	Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. Long-term declines in populations and dependents associated with NAVSTA Mayport would not impact fire and emergency services, recreational facilities and fields, family services, or childcare services._Decreases in school age children (23 percent) could result in indirect impacts to public schools that would expected to be somewhat offset by other demographic shifts affecting these schools. The FEIS provides demographic data that Duval County School District may use in their enrollment projections used for long-range planning for school facilities and districting planning.
		2	Same as Alternative 1, but decrease in school age children would be 19 percent.
		5	Same as Alternative 1, but decrease in school age children would be 21 percent.
		6	Same as Alternative 1, but decrease in school age children would be 9 percent.
	Group 2	3	Same as Alternative 1, but decrease in school age children would be 32 percent.
		7	Same as Alternative 1.
		9	Same as Alternative 2.
		11	Same as Alternative 6.
	Group 3	4	Same as Alternative 1, but decrease in school age children would be 12 percent.
		8	Same as Alternative 1, but decrease in school age children would be 3 percent..
		10	Minor long term increased demand on fire and emergency services, recreational facilities and fields, family services, childcare services, and education at local schools due to 300 increase in dependent population and 92 increase in school age children. The FEIS provides demographic data that Duval County School District may use in their enrollment projections used for long-range planning for school facilities and districting planning.
		12	Due to the net gain of 1,200 in net daily population; 2,900 gain in dependent population; and 890 gain in school age children; a long-term increase in demand on fire and emergency services, recreational facilities and fields, family services, childcare services, and education at local schools would be expected. Most impacts would be minor, but increase in school age children could result in overcrowding at Duval County schools attended by NAVSTA Mayport dependents. The FEIS provides demographic data that Duval County School District may use in their enrollment projections used for long-range planning for school facilities and districting planning. To mitigate potential impacts to schools, the Navy would provide assistance to the Duval County School District (to the extent practicable) in their pursuit of Federal Education Impact Aid.
	No Action		Impacts between the 2006 baseline and the 2014 end state were compared. Some impacts have already occurred due to decommissioning of the KENNEDY in 2007 and downsizing of SERMC. Decreases in school age children (32 percent) could result in indirect impacts to public schools that would expected to be somewhat offset by other demographic shifts affecting these schools. The FEIS provides demographic data that the Duval County School District may use in their enrollment projections used for long-range planning for school facilities and districting planning.
Utilities	Group 1	1	Increased impervious surface for headquarters facility would be addressed through adherence to permit processes and requirements, including an Environmental Resource Permit, and the Navy's Low Impact Development (LID) policy.
		2	No impacts expected.
		5	Same as Alternative 1.
		6	Same as Alternative 1.
	Group 2	3	No impacts expected.
		7	Same as Alternative 1.
		9	No impacts expected.
		11	Same as Alternative 1.
	Group 3	4	The area of potential development would require electrical, steam, compressed air, potable water, and stormwater upgrades to accommodate the demand for nuclear propulsion plant maintenance facilities. These improvements are part of the proposed action for this alternative. Localized impacts to stormwater infrastructure would be addressed with adherence to permitting processes and requirements, including an Environmental Resource Permit, and the Navy's LID policy.
		8	Same impacts as Alternative 4.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.
	No Action		No impacts expected.
Environmental Health and Safety	Group 1	1	Construction of headquarters facility would result in a short-term increase in hazardous/toxic materials use and waste disposal and increase related risks for hazardous/toxic materials release that would be managed in accordance with established procedures for proper management of these items. Construction related safety risks would be managed in accordance with established safety procedures.
		2	No impacts expected.
		5	Same impacts as Alternative 1.
		6	Same impacts as Alternative 1.
	Group 2	3	Dredging project would result in increased fuel acquisition, temporary storage, and consumption. Dredging related safety risks would be managed in accordance with established safety procedures. Impacts would be short-term.
		7	Same impacts as Alternative 3, plus the impacts described for Alternative 1.
		9	Same impacts as Alternative 3.
		11	Same impacts as Alternative 7.
	Group 3	4	Same as Alternative 3, plus construction of the nuclear propulsion plant maintenance facilities would result in a short-term increase in hazardous/toxic materials use and waste disposal and increase related risks for hazardous/toxic materials release.
		8	Same impacts as Alternative 4, plus impacts described for Alternative 1.
		10	Same impacts as Alternative 4.
		12	Same impacts as Alternative 8.
	No Action		No impacts expected.

CHAPTER 3
AFFECTED ENVIRONMENT

This chapter describes relevant existing conditions for resources potentially affected by the proposed action and alternatives described in Chapter 2. Information presented in this section represents the environmental baseline to which the proposed action is compared in Chapter 4. In accordance with NEPA and CEQ guidelines, this chapter discusses the existing condition of the human and natural environment that could potentially be affected, beneficially or adversely, by the alternatives. For the convenience of the reviewer, a Glossary can be found in Appendix K that provides definitions and/or explanations of technical terms used throughout this document.

Affected Environment and Baseline Year

Descriptions of the affected environment are provided for the following resources: earth resources, land and offshore use, water resources, air quality, noise, biological resources, cultural resources, traffic, socioeconomics, general services, utilities, and environmental health and safety. The baseline year, 2006, best represents recent operations at NAVSTA Mayport, as 2006 was the final year of operations for the KENNEDY prior to its decommissioning in 2007. Therefore data from, or representative of, this baseline year are used throughout this chapter for all resource analyses unless otherwise specified. As noted in Section 2.1, the baseline year includes a crew of 2,498 for the KENNEDY (the August 2006 manning level prior to beginning the decommissioning process).

Region of Influence

The following sections provide a definition of each resource and a description of the associated region of influence (ROI) in which potential impacts would occur. The ROI varies by resource. For some resources the ROI is largely confined within the area of potential development at NAVSTA Mayport (i.e., soils, wetlands, vegetation). For other resources, the ROI includes a larger geographic area (i.e., socioeconomics, land use, etc.).

3.1 EARTH RESOURCES

Earth resources refers to the composition of the earth surface and elements of variation and change. For this analysis, the relevant aspects of earth resources: topography, geology, soils, beaches and beach morphology, marine sediments, and ODMDS capacity are described in the subsections that follow. The ROI for topography, geology, and soils is the area of proposed development at NAVSTA Mayport and includes a discussion of longshore sediment transport. The ROI for marine sediments includes the areas proposed for dredging and surrounding areas including portions of the lower portion of the St. Johns River, coastal areas of the Atlantic Ocean, and the NAVSTA Mayport turning basin and entrance channel (see Figures 2.3-1, 2.3-2, and 2.3-3). The ROI for marine sediments includes potential open water disposal areas for dredged material in the vicinity of NAVSTA Mayport, including the Jacksonville and Fernandina ODMDSs (see Figure 2.3-1). The ROI for marine sediments also includes the ODMDS capacities for both the Jacksonville and Fernandina ODMDSs.

3.1.1 Topography

The topographical character of NAVSTA Mayport and surrounding areas is a result of glacial movement during the Pleistocene era (1.8 million to 10,000 years ago) causing changes in sea level. In geologic terms, the NAVSTA Mayport area as in the Northern Coastal Strip and is part of the Sea Island District, where elevations range from sea level to approximately 30 ft above mean sea level (msl). Land elevations on NAVSTA Mayport are relatively flat, ranging from at or above 10 ft msl with topographic relief generally occurring as downsloping toward the St. Johns River. Notable exceptions to this range include the small hill along Wharf A and the sandy ridge east of Baltimore Street (DoN 2007b).

The topography within the area of potential development for the CVN maintenance facilities slopes slightly from east to west, from 12 ft msl in the east to 7 ft msl at the western edge of the site. There is a swale area where elevations drop from 9 msl to 5 ft msl. Elevations rise to 12 ft msl surrounding Building 347 in the southwestern portion of the site. At the northeastern corner of the site there is an approximately 150-sf depression in a paved surface that drops to 3 ft msl. The topography at the site for the DESRON or PHIBRON headquarters building is flat at 12 ft msl. A drainage ditch that drains to an elevation of 7 ft msl is located just to the west of this site. The topography at the proposed parking sites is flat with an elevation of 12 ft msl for the site near the CVN facilities and at 7 ft msl for the parking site west of New Maine Street and northwest of the Fire Station. Topography within the Massey Avenue widening and intersection improvement areas is generally flat on the roadways with an elevation of approximately 12 ft msl with stormwater conveyance ditches along the roadways at an average elevation of about 8 ft msl.

3.1.2 Geology

Geology is characterized in terms of physiographic divisions that are based on terrain texture, rock type, geologic structure, and history. The geologic terms that are used here are defined in the Glossary, Appendix K. NAVSTA Mayport and the surrounding vicinity fall within the coastal lowland physiographic division of northeast Florida, which runs roughly parallel to the coastline and extends from the Atlantic Ocean to just west of downtown Jacksonville. In general, the surface and near surface deposits in this division consist of limestone, shell, sand, and clay (DoN 2007b).

Duval County is underlain by a thick sequence of Eocene (54.8 - 33.7 million years ago) and younger siliciclastic sands and marine carbonate sediments, which consist of, in descending order, surficial deposits, the Hawthorn Group (i.e., a Miocene-age formation that overlies the Upper Floridan Aquifer and consists of phosphatic, clayey sand to sandy clay), and an Eocene marine carbonate sequence. Surficial deposits in Duval County are composed of Holocene (10,000 years ago to present) to Pleistocene (1.8 million - 10,000 years ago) age sands, silts, clays and shell beds, and sands, silty clays, shell beds, and limestone beds of the Pliocene-aged Cypresshead Formation and Nashua Formation, where present. In the NAVSTA Mayport vicinity, surficial deposits are approximately 70 ft thick. The Hawthorn Group consists of interbedded variably phosphatic and silty clayey sands, and sandy clays interbedded with phosphatic sands and variably phosphatic, sandy, silty dolostones, and limestones. The Hawthorn Group is approximately 500 ft thick in the NAVSTA Mayport vicinity. The Eocene age marine carbonate sequence is composed of, in descending order, Ocala Limestone, Avon Park Formation, and Oldsmar Formation. The Ocala Limestone consists of massive fossiliferous, chalky to granular limestone. The Avon Park and Oldsmar Formations consist of interbedded limestones and dolostones. The Eocene age marine carbonate sequence is more than 1,500 ft thick in Duval County (DoN 2007b).

NAVSTA Mayport is not located in a seismically active area, with only two recorded seismic events occurring in northern Florida in 1879 and 1893. The 1879 event occurred in St. Augustine (about 35 miles south of NAVSTA Mayport) and affected a large portion of northern Florida whereas the 1893 earthquake produced more local seismic effects. The intensity of these events was not measured with scientific instrumentation such as seismometer (i.e., according to the Richter scale) (DoN 1997).

3.1.3 Soils

Soils on NAVSTA Mayport are comprised of 13 soil classifications consisting of medium to fine sands with one example of mucky peat series. The soil series, locations, descriptions, uses, and ratings are presented in Table 3.1-1. In general, the soils located on NAVSTA Mayport are high in permeability and tend to be low in organic content and available water with the exception of the mucky peat soils. Figure 3.1-1 depicts the soil classification types located within the vicinity of the area of potential development. The soil classification types that occur within the proposed action area are Urban land soils and Arent soils. Urban land is soil that cannot be observed since more than 85 percent of the surface is

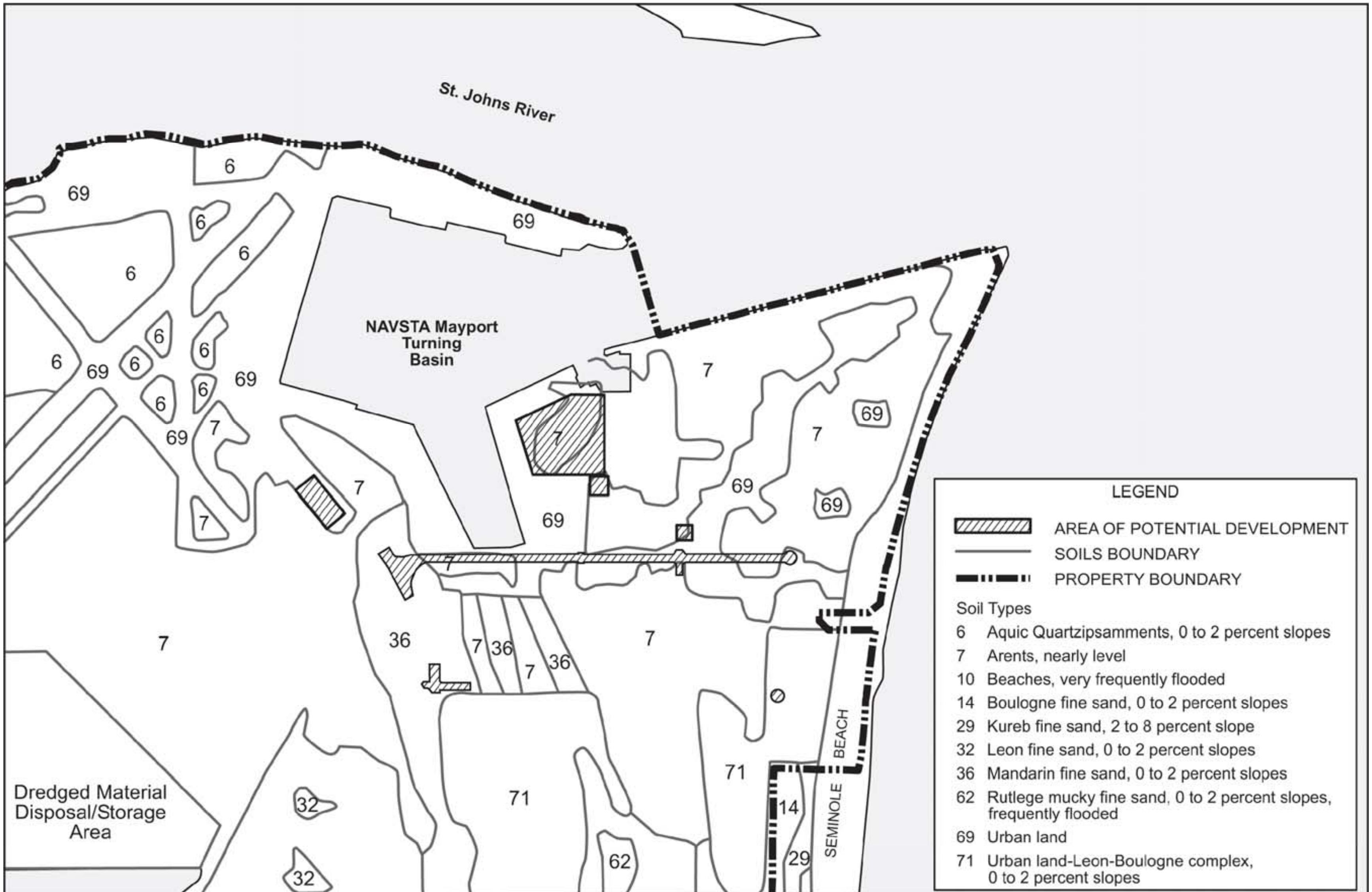


Figure 3.1-1
Soils Near the NAVSTA Mayport Area of Potential Development

Table 3.1-1 Soil Map Units Occurring on NAVSTA Mayport

Type of Soil	Location	Description
Aquic Quartzipsamments and Arent soils	Most large developed areas including the golf course and the runway areas and adjacent clear zones, including proposed areas of potential development.	These soils are generally characterized by being reworked during manmade earth moving operations.
The beaches, Fripp fine sand (2% to 8% slopes) and the Kureb fine sand (2% to 8% slopes)	Occurs along the Atlantic beaches and dune and ridge areas immediately behind the beaches.	These fine sands are characterized by a depth to water table over 6 ft in natural conditions.
Leon, Mandarin, Kershaw, Ortega, and Pottsburg fine sand soils	Occurs in broad flatwood areas, on ridges, and on isolated small rounded hills, including proposed areas of potential development. Most of these soil groups on NAVSTA Mayport are heavily vegetated.	These soils tend to have moderate depth to water table ranging between 10 to 60 inches depending upon the season.
The Tisonia mucky peat and Wesconnett fine sand	Occur in wetland areas on NAVSTA Mayport.	These are characterized by a depth to water table of less than 10 inches and, in many instances, are water covered for the entire year.

Source: DoN 2007b

covered with asphalt, concrete, and other structures. Arent soils are soils that have been reworked by manmade earth moving operations. Beach soils are discussed in more detail in Section 3.1.4.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water and is one of six factors used to predict the average annual rate of soil loss by such erosion in tons per acre per year. Values of K range from 0.02 to 0.69; higher values correspond to higher susceptibility for erosion. For those soils at NAVSTA Mayport that have been rated, all have a 0.10 K Factor rating. Wind erodibility groups are established for soils that have similar properties affecting their susceptibility to wind erosion. Soils assigned to Group 1 are the most susceptible to wind erosion and those assigned to group 8 are least susceptible. The soils at NAVSTA Mayport within the area of potential development are in wind erodibility Group 1 (U.S. Department of Agriculture 2006).

3.1.4 Beaches and Beach Morphology

As shown in Figure 3.1-2, the Duval County ocean shoreline is approximately 16 miles long, of which 10 miles occurs south of the St. Johns River entrance. South from the southern jetty at the mouth of the St. Johns River, the beach sections are referred to as Mayport Beach, Hanna Park Beach, Seminole Beach, Atlantic Beach, Neptune Beach, and Jacksonville Beach. Mayport Beach corresponds with NAVSTA Mayport (although the submerged lands below the mean high water line is owned by the State of

Florida). Hanna Park Beach is associated with Kathryn Abbey Hanna State Park; Seminole and Atlantic Beach are associated with the City of Atlantic Beach; Neptune Beach within the City of Neptune Beach; and Jacksonville Beach within the City of Jacksonville Beach. Three inlets occur in Duval County: Nassau Sound, Ft. George Inlet, and the St. Johns River entrance (see Figure 3.1-2).

Existing data on Duval County beach morphology is primarily available as a result of studies and evaluations conducted under the FDEP beach nourishment program. Beach morphology is affected by the transport of beach sediments from breaking waves and surf combined with currents, inlets and inlet stabilization, longshore sediment transport (i.e., displacement of sediments within the surf zone parallel to the coast), and beach nourishment. As shown in Figure 3.1-2, the FDEP has established 80 sequentially numbered survey reference points along Duval County beaches, generally referred to as "R" monuments, spaced approximately 1,000 ft apart.

Longshore sediment transport is among the most important nearshore processes that control beach morphology and determines in large part shore erosion, accretion (the buildup of land or accumulation of unconsolidated material within the coastal system), or stability. As evidenced by the long-term accretion of sand north of the St. Johns River entrance jetties and the long-term erosion pattern south of the jetties, sand is deposited on these beaches from north to south. There are several widely varying estimates of net longshore sediment transport, ranging from about 110,000 to 480,000 cy per year (FDEP 2000a).

Collectively, Nassau Sound, Ft. George Inlet, and St. Johns River entrance inlets are a driving force in shaping the shoreline of Duval County. Stabilization of the St. Johns River entrance has had a tremendous impact on beaches to both sides of the inlet. Long-term accumulation of sediment updrift of the St. Johns River entrance jetties has resulted in the northward migration of Ft. George Inlet and reorientation of Little Talbot Island. South of the St. Johns River entrance jetties, there is a progressively southward spreading erosion pattern that has essentially been held in check by numerous beach re-nourishments since 1963.

Maintenance dredging of the St. Johns River entrance channel has occurred on a regular basis with placement of beach-compatible sand on the downdrift shoreline south of the river entrance. Sand material from the river and other borrow areas has been periodically used to nourish the beach along this section of the shoreline.

Longshore sediment transport in the area of the St. Johns River inlet is complex due to the presence of the Ft. George inlet, an inlet just north of the St. Johns River mouth that has not been stabilized by jetties. Wave modeling results conducted by USACE (Gosselin et al., 2000) suggest that immediately

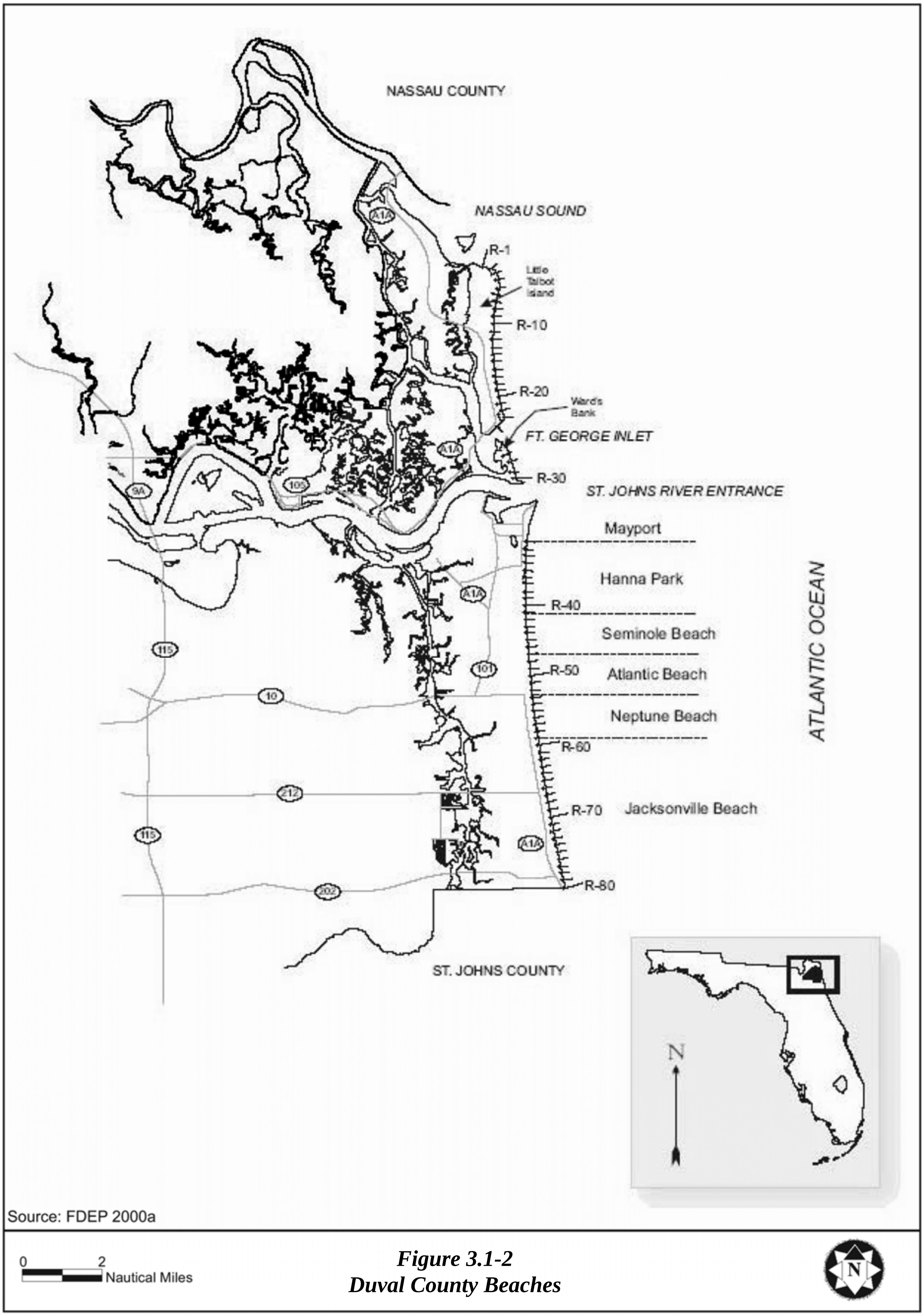


Figure 3.1-2
Duval County Beaches

north of the St. Johns River, the net alongshore sediment transport potential occurs southward. The study also stated that a transport node lies approximately 0.8-mile north of the St Johns River inlet. North of this node, the net sediment transport occurs northward toward Ft. George Inlet. The predicted results are consistent with the overall behavior of Ward's Bank, the spit of land immediately north of the St. Johns River inlet. Specifically, the modeling results explains the continuing lengthening of the Ward's Bank spit to the north and the erosion at its center.

The erosion pattern south of the St. Johns River entrance south jetty is associated with a sheltered zone that results from the jetties at the St. Johns River entrance changing the direction of waves at the shoreline. As shown in Figure 3.1-3, the north jetty extends into the Atlantic Ocean about 7,500 ft from the southern tip of Wards Band while the south jetty extends about 4,700 ft from the shoreline at the northeastern tip of NAVSTA Mayport. The jetties extend into 20 ft of water (relative to MLLW) and are thought to allow little or no sediment transport beyond the St. Johns River inlet.

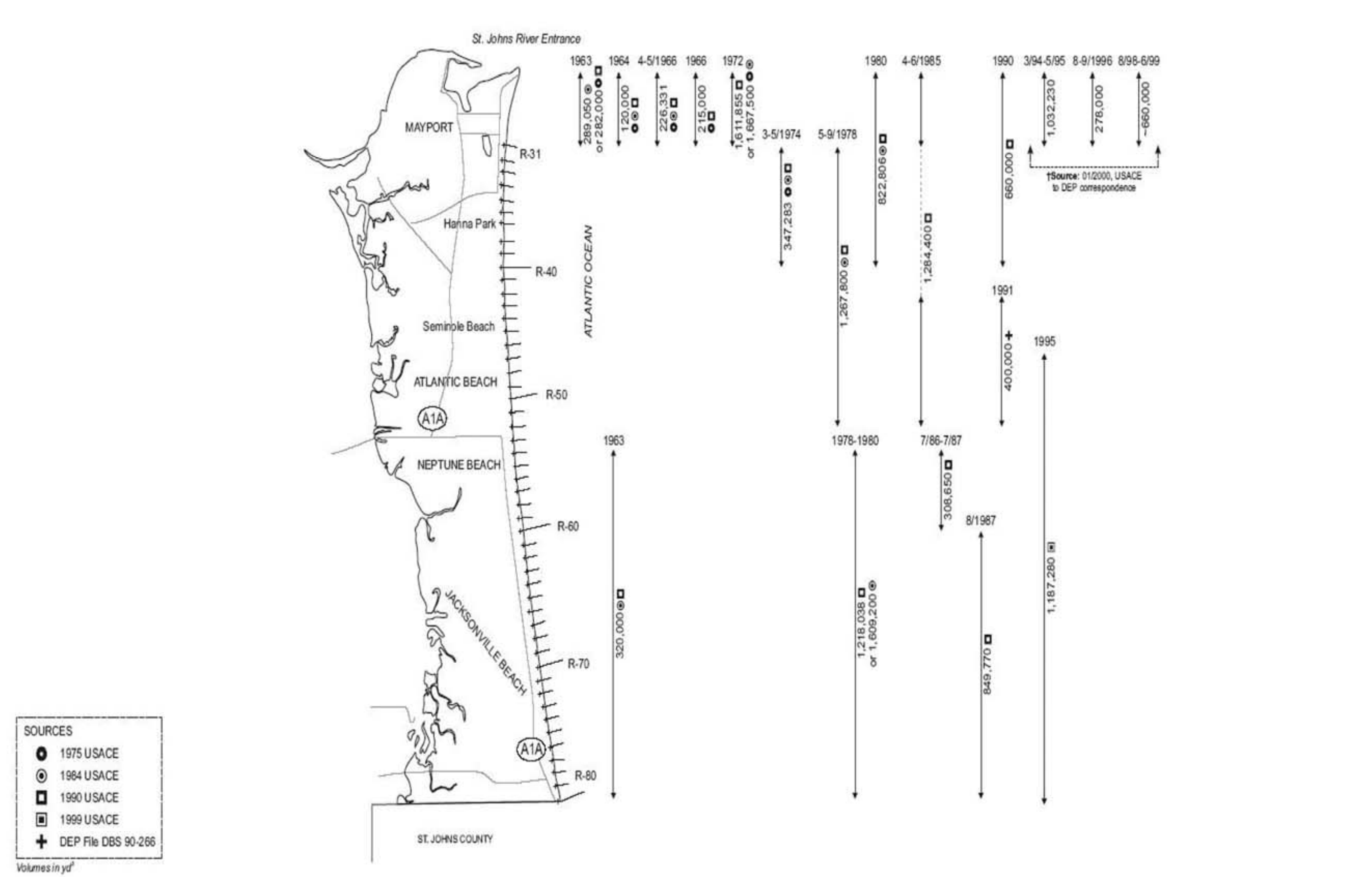
Immediately north of the St. Johns River, the net alongshore sediment transport potential occurs southward. A transport node lies approximately 0.9 miles north of the St. Johns River and north of this node, the net transport occurs northward toward Ft. George Inlet. South of the St. Johns River, the net sediment transport is typical of that found within the shadow zone of jetties. Specifically, a net northward transport switches to a net southward transport approximately 0.5-mile south of the St. Johns River centerline. South of this switch, sediment transport decreases in magnitude but remains southward (Gosselin *et al.* 2000).

Pre-nourishment erosion rate estimates are estimated to be on the order of -5.5 ft per year south of the jetty and outside of the shelter zone and taper off gradually to zero at the southern end of the county. (Note that the available data that this is based on is very limited for the post-jetty, pre-nourishment time period. In addition, the rates may be lower than what was actually occurring due to possible interference by human-made structures erected along the coast to fight beach erosion) (FDEP 2000a).

Figure 3.1-3 St. Johns River Entrance Channel

The Duval County beach nourishment program began as early as 1963, when dredge material from the St. Johns River entrance channel and Jacksonville Harbor was deposited at the NAVSTA Mayport beaches, Neptune Beach, and Jacksonville Beach. Since that time, there have been at least 15 nourishment projects in Duval County from NAVSTA Mayport south to R-80. Figure 3.1-4 gives an overview of the numerous fills placed on Duval County's beaches through March 1999 (FDEP 2000a).

After 1999, only one beach nourishment project occurred in Duval County. In 2003, beach re-nourishment work was started using sand dredged from the river entrance. This work was stopped after placement of about 200,000 cy when it was determined the material contained excessive amounts of shell and clay and was therefore not suitable for beach placement (USACE 2005b). This beach placement work was then restarted and completed in 2005 using material from an offshore borrow area (located



Source: FDEP 2000a

0 2 Miles
0 3 Kilometers

Figure 3.1-4
Duval County Beach Nourishment (1963-1999)

approximately eight miles offshore Atlantic Beach). The project totaled 5.9 miles in length in two reaches along the beach. The northern reach extended along most of the length of Atlantic Beach, from R-43 to R-53. The southern reach extended from R-57 to R-80, encompassing the southern portion of Neptune Beach and the full length of Jacksonville Beach. The final contract payment for volume placed was 615,198 cy (USACE 2005b). This beach nourishment project has a design interval of approximately five to seven years, which appears to be a common design interval for Duval County beach nourishment projects (FDEP 2005).

The sand sources for these various beach nourishment projects include beach quality sand that is dredged during maintenance dredging of the St. Johns River federal navigation channel, sand that is mined from offshore borrow areas, and, in one instance, sand that was temporarily stored at the Bucks Island Dredged Material Management Site (FDEP 2000b). Material dredged from the NAVSTA Mayport turning basin and entrance channel has never been used for beach nourishment projects.

3.1.5 Marine Sediment

Marine sediment refers to the material to be dredged from the NAVSTA Mayport turning basin and entrance channel, federal navigation channel, as well as sediment located at the Jacksonville and Fernandina ODMDSs. Technical terms used in this section are defined in the Glossary, Appendix K.

To understand the existing quality of marine sediments to be dredged, a sediment sampling and testing program was performed within the reaches of the turning basin, entrance channel, and federal navigation channel proposed for deepening (Appendix A.3). This sediment testing program was performed pursuant to guidance documents of the USEPA and USACE. All chemical testing was conducted in compliance with USACE and USEPA's *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, or "Green Book," (USEPA and USACE 1991) and USACE/USEPA, Region 4 Regional Implementation Manual (USEPA and USACE 1993). This sediment sampling and testing program, started in March 2007, included collecting samples of sediment from existing depths down to a depth of -56 ft MLLW, which is below the expected project dredge depth of -54 ft MLLW that would be required with the Group 2 and 3 alternatives. A total of 19 representative samples were collected throughout the proposed dredging areas in the NAVSTA Mayport turning basin and entrance channel, and federal navigation channel to screen sediment characteristics and quality. In March 2007, six samples were collected within the turning basin using a geotechnical fixed drill rig placed on a tug-supported barge. A sample of surficial sediment and site water in the turning basin was also collected for elutriate analysis. Elutriate testing is a widely recognized conservative estimate of contaminant release from dredging into the water column. Elutriate analysis involves mixing sediment and site water and testing for the presence of contaminates in the dissolved state. Elutriate test results replicate the content of contaminants released from suspended sediment that can result from vessel movements, dredging, or some other form of in-water construction. Due to adverse weather conditions, a second round of sediment collection was required for the remaining 13 sediment samples in the entrance channel and federal navigation channel. This second round of sampling was conducted in June 2007 using a vibracore sampling device; vibracore sampling uses vibration rather than drilling to collect sediments (See Glossary, Appendix K, for more detail).

The intent of the sediment sampling and testing program was to characterize the physical and chemical nature of the sediments that are included in the proposed dredge prism. The analysis in the DEIS represented the first and second tiers of the three-tier approach to testing marine sediment for suitability for unconfined placement in approved ocean disposal sites per the “Green Book” guidance (USEPA and USACE 1991). The third tier, discussed in the FEIS, involved bioassay and bioaccumulation tests of the sediment pursuant to the criteria for ocean disposal contained in Section 103 of the MPRSA, which was initiated after publication of the DEIS (Bioassay and bioaccumulation tests address the potential for organisms to be impacted by a contaminant, see Appendix K, Glossary for more detail).

The March and June 2007 rounds of sediment sampling and testing are considered a preliminary sediment quality characterization program. These results have provided physical characteristics of the sediment that includes indications of the percent sand, clay, and silt mixture present in the material that would be dredged under the Group 2 and Group 3 alternatives. Bulk chemistry tests provide data on the presence of metals, pesticides, polychlorinated biphenyls (PCBs). PCB’s are synthetic organic compounds used in electrical transformers, capacitors, and wiring prior to being banned in the 1970s. Sediment testing for polycyclic aromatic hydrocarbons (PAHs) also took place, PAH’s are organic compounds commonly produced by fossil fuel combustion. The results of these physical and chemical tests gave an indication of suitability of the dredged material for ocean disposal and for other disposal options. The third tier bioassay and bioaccumulation tests of the sediment completed by the Navy after publication of the DEIS are required by USEPA during the permitting process and must be verified by the USACE and USEPA before the dredged material is deemed suitable for ocean disposal.

3.1.5.1 NAVSTA Mayport Turning Basin and Entrance Channel

The NAVSTA Mayport turning basin was constructed during the early 1940s by dredging the eastern part of Ribault Bay. Dredge material from the basin was used to fill parts of Ribault Bay and other low-lying areas in order to elevate the land surface. The basin was originally dredged to a depth of -29 ft MLLW and, in 1952, was deepened to a depth of -40 ft MLLW to provide access to larger ships. The 1952 dredge material was used to fill other topographic low areas of NAVSTA Mayport (USEPA 2006b). Prior to 1960, the turning basin was dredged to -42 ft MLLW (Hardy Heck Moore Inc. 2001). The turning basin is currently maintained at an average depth of -42 ft MLLW (plus 2 ft of overdepth), with ship berths ranging in depth from -30 to -50 ft MLLW. The basin is a deepwater surface ship berthing facility whose entrance channel meets the main navigation channel at the mouth of the St. Johns River. The NAVSTA Mayport entrance channel is approximately 500 ft wide extending approximately 5,000 ft until it joins with the federal navigation channel. Its depth ranges between -51 to -42 ft MLLW.

Sediment chemistry analyses conducted in 2002 prior to maintenance dredging of the NAVSTA Mayport entrance channel and turning basin revealed that concentration levels of aluminum, arsenic, chromium, copper, iron, lead, nickel, and zinc were more than two times higher than amounts obtained at the Atlantic Ocean reference station (near the Jacksonville ODMDS). Cadmium and mercury were either undetectable or present at very low levels (0.2 parts per million [ppm]) in both the project area and reference locations. No pesticides or PCBs were detected and only low levels of PAHs and organo tin (chemical compounds based on tin with hydrocarbon constituents) were detected in some of the sediments in 2002.

<u>Physical Characteristics of Sediment to be Dredged (NAVSTA Mayport Turning Basin and Entrance Channel)</u>

Sediment sampling and testing conducted in March 2007 indicated sediments within the turning basin consist primarily of fine grained materials (e.g., silt and clay). Six sediment samples from existing depths to depths of -56 ft MLLW were collected within the basin during March 2007. The location and subsurface of these 2007 boring sites are shown in Figure 3.1-5 (Note: Sample N-20/N-22 is the same sediment sample that was recorded by the receiving laboratory for physical analysis as N-20 and for chemical analysis as N-22). This figure also includes a cross section that uses select sites from similar sampling conducted in a 1994 survey (USACE 1994a) along with the 2007 boring sites. Water depths in the turning basin ranged from -40 to -45 ft MLLW. The sediment that lies on the surface is silt/clay across the basin, ranging in thickness from 3 to 10 ft.

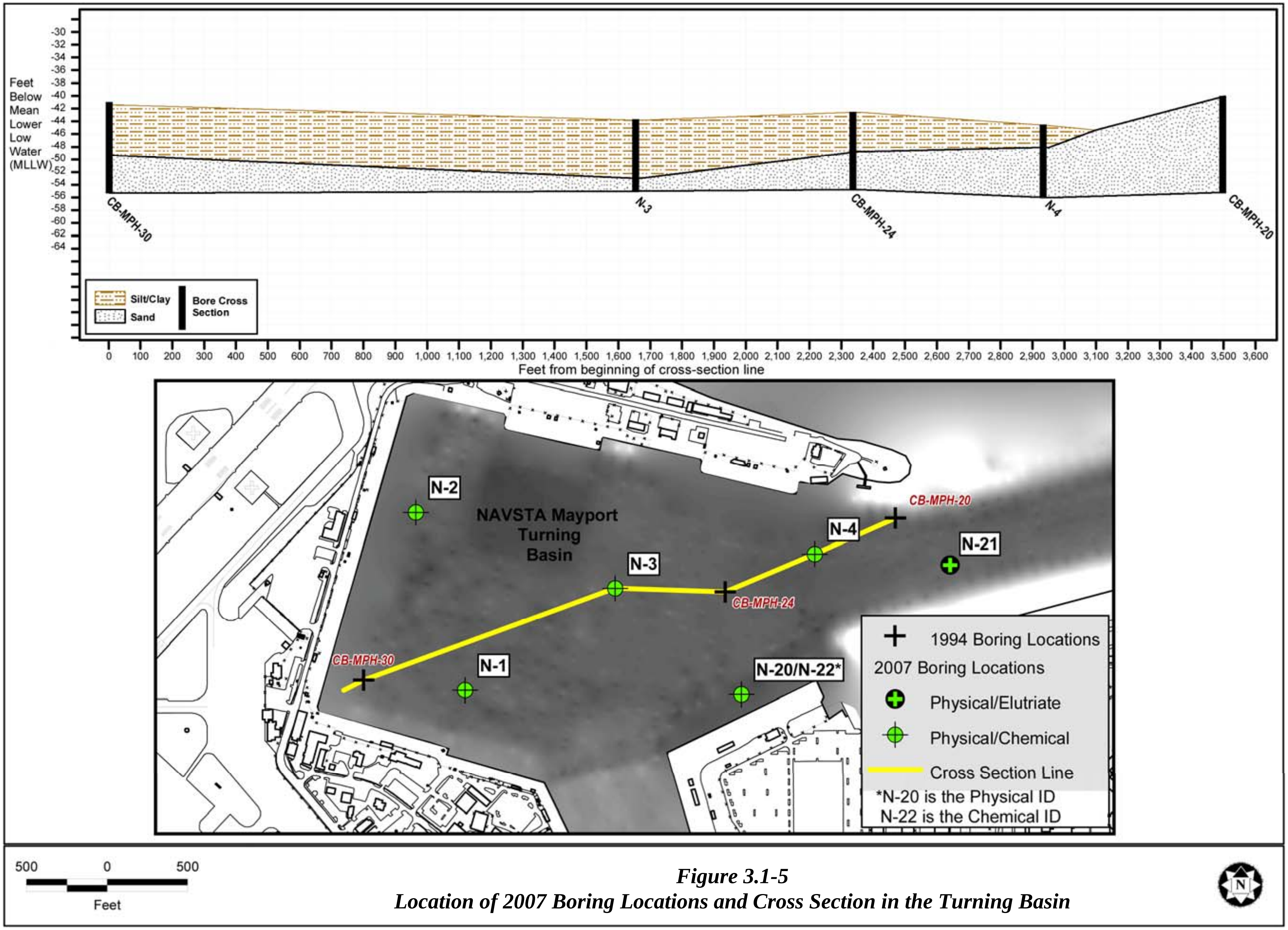


Figure 3.1-5
Location of 2007 Boring Locations and Cross Section in the Turning Basin

The thinnest silt/clay layers were observed at the basin and entrance channel interface. Underlying sand layers were encountered between -46 and -56 ft MLLW and rather consistently between -48 to -50 ft MLLW. Sand layer thickness observed in the six March 2007 samples ranged from 0 to 8 ft thick. June 2007 samples included locations at the eastern end of the NAVSTA Mayport entrance channel and throughout the federal navigation channel. Those results are discussed below in Section 3.1.5.2.

Figure 3.1-6 illustrates the sediment types by location and depth within the proposed dredge prism in the NAVSTA Mayport turning basin. Each sample location was sub-sampled throughout the depth of the boring; sub-sample numbers increase to correspond with the boring depth (e.g. NS1-1 is the surface and NS1-6 is the deepest portion of the boring). As illustrated, samples varied, but all have a surficial layer of silt and clay and most have a sand layer in the deeper portions of the boring.

<u>Sub-bottom Profiling Investigation (NAVSTA Mayport Turning Basin and Entrance Channel)</u>

Geological borings in the NAVSTA Mayport turning basin and entrance channel and federal navigation channel indicate the presence of sand layers that may be suitable for beneficial reuse as beach nourishment in the vicinity of NAVSTA Mayport. During preparation of the DEIS, SeaVision Marine Services LLC (SeaVision) performed acoustic (sound) sub-bottom profiling surveys of the proposed dredged prism in the turning basin and entrance channel and federal navigation channel. The full report of these sub-bottom surveys is contained in Appendix A.4.

The sub-bottom profile investigation consisted of taking a series of survey lines throughout the turning basin and crossing from the toe of slope of one side of the channel to the toe of slope on the other side of the entrance channel and federal navigation channel. In the turning basin, the profiles were spaced approximately 500 ft apart with checklines spaced 500 ft apart to form a grid. In general, the survey profiles in the entrance channel and the federal navigation channel were set at 1,000 ft apart. The sub-bottom profiles produce imagery of the subsurface that allows interpretation based on the speed of the acoustic reading for different sediment types (i.e., silt, sand, and clay). The interpretation of the surveys is also correlated with the geological borings using these data points to verify the location and thicknesses of types of sediment layers.

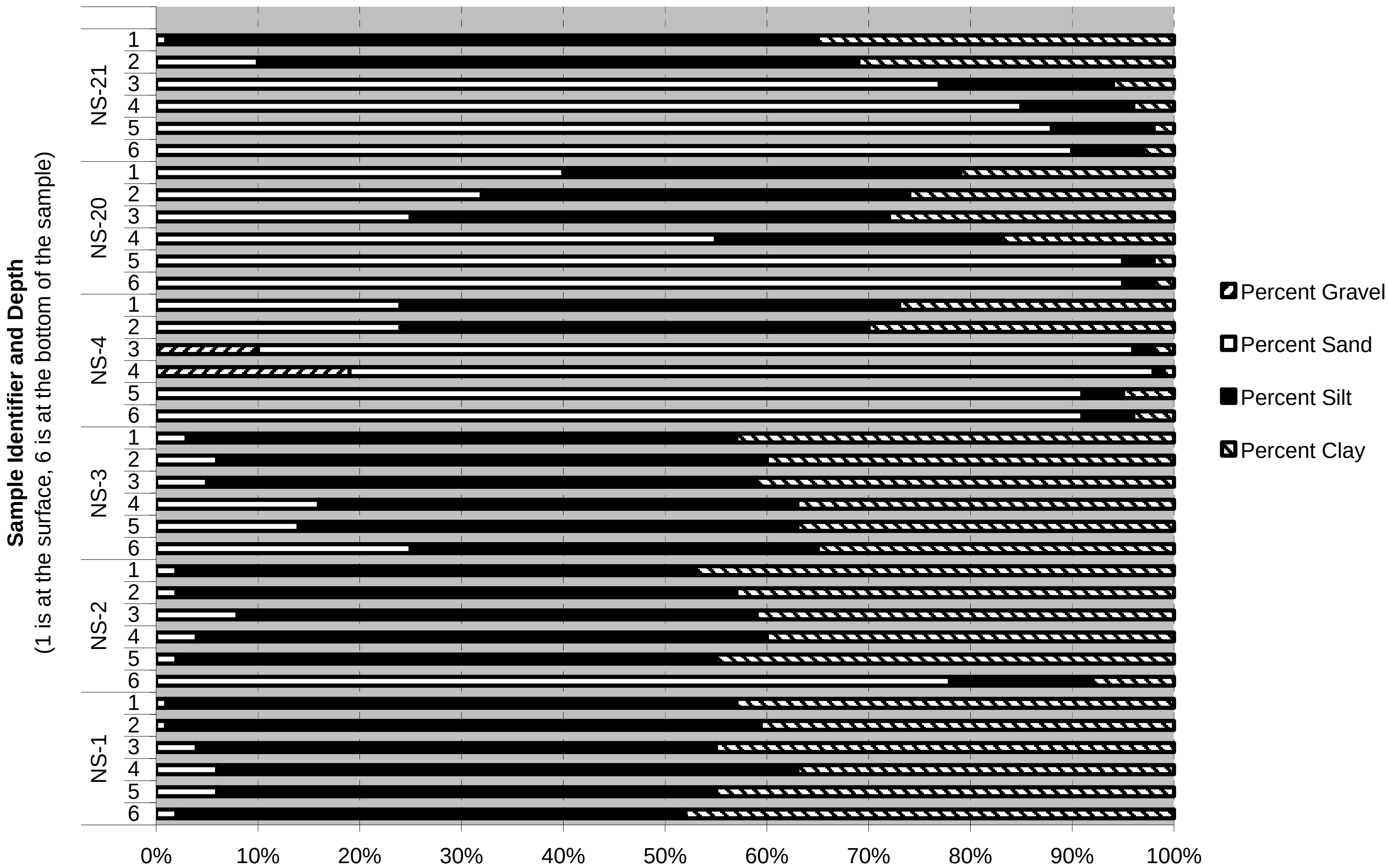


Figure 3.1-6
Particle Size Distribution NAVSTA Mayport Turning Basin Sediment Samples

The sub-bottom investigation within the NAVSTA Mayport turning basin did not produce discernable results in terms of isolating defined sand layers retrievable for beach placement reflecting the extensive combinations of silt and silty sand or silty clay. However, the outer portion of the entrance channel and portions of the federal navigation channel were identified as having sand layers within the proposed dredge prism that were located and quantified. Based upon the interpretation of the sub-bottom profiles, approximately 110,000 cy of sand may exist in the outer section of the entrance channel that would be suitable for beach nourishment. The identified sand layers range in thickness from 2 to 15 ft. The sand layers are generally covered by an overburden of silt or silty clay with an average thickness of 1.4 ft ranging from 0 to 6.5 ft in depth from the existing (October 2007) sea floor. Since publication of the DEIS, USACE conducted additional of vibracore sampling in the locations potentially containing thicker sand layers and oncluded that it was not feasible to separate the limited beach quality sand layers from the non-beach quality material.

<u>Chemical Analyses of Sediment Samples (NAVSTA Mayport Turning Basin and Entrance Channel)</u>

Five of the six March 2007 sediment samples within the turning basin also were analyzed for the presence of chemical contaminants. Testing was conducted for bulk chemical parameters including metals, PCBs, semi-volatile organics or PAHs, pesticides, and inorganics. The report of the results is contained in Appendix A.3. Tests were conducted for a total of 12 metals, 28 types of PCBs, 16 types of PAHs and 19 types of pesticides. Each of the five samples was tested for each of these 75 chemical parameters. The majority of these tests did not detect the presence of any contaminants in the dredge profile. The analyses did, however, find low concentrations of metals, some PAH analytes, and some PCBs parameters in the samples. Of particular note, no pesticides and most of the tested PCBs analytes were not detected in these turning basin sediment samples. The implications of the results are discussed below.

For this preliminary phase of testing, the results of the bulk sediment chemistry testing are compared to the Sediment Quality Guidelines (SQG) developed by National Oceanic and Atmospheric Administration (NOAA) through its National Status and Trends Program. The SQG were not promulgated as regulatory criteria or standards, nor are they intended as remediation or discharge attainment targets, pass-fail criteria for dredge disposal decisions, or any other regulatory purpose. Rather, they are intended as informal (non-regulatory) guidelines for use in interpreting chemical data from analyses of sediments. The SQGs were derived from data from studies throughout North America so that they could be applied nationwide in the National Status and Trends Program. Because SQGs were needed that would (1) estimate concentrations below which adverse effects were not likely and (2) estimate concentrations above which adverse effects were more likely, two values were derived for each substance. These two values are identified as Effects Range Low (ERL) and Effects Range Median (ERM) and are indicative of the concentrations below which adverse effects rarely occur and above which adverse effects frequently occur, respectively. The NOAA SQGs are also utilized by USEPA Biological Technical Assistance Groups as sediment screening values.

Of the substances detected in the NAVSTA turning basin sediments, only one metal (arsenic) and two of the 16 PAHs (acenaphthene and fluorene) had concentrations exceeding NOAA ERL thresholds in two of the five sediment samples collected. These three incidents of exceedance are only slightly above the ERL threshold and are well below the ERM levels. All of the other detected concentrations of metals, PAHs, and PCBs are well below the respective ERL levels. See Appendix A.3 for full discussion of testing results.

These testing results generally reflect a low contamination level for marine sediments in the NAVSTA Mayport turning basin to depths of -56 ft MLLW. Additionally, the contaminant levels of the March 2007 results correlate favorably with those found during testing conducted prior to recent maintenance dredging projects at NAVSTA Mayport. Those maintenance dredging sediments also underwent bioassay/bioaccumulation testing pursuant to Section 103 of the MPRSA and were verified as suitable (i.e., meets USEPA mandated MPRSA Section 103 criteria) for unconfined ocean disposal at the Jacksonville ODMDS.

Theoretical Bioaccumulation Potential (TBP) (NAVSTA Mayport Basin and Entrance Channel)

As an additional estimation of sediment quality within NAVSTA Mayport the turning basin, the results of sediment chemistry testing were used in calculations that *approximate* the potential of contaminants measured in sediment samples to become accumulated in the tissues of benthic organisms. (The *actual* third tier bioassay and bioaccumulation tests of the sediment conducted after publication of the DEIS are discussed in the section below). The TBP provides estimates of bioaccumulation for proposed dredging projects that can be compared with the bioaccumulation results of past ocean disposal projects as well as action levels to prevent human health risks from contaminants that are published by the U.S. Food and Drug Administration (USFDA) for shellfish (USFDA 2001). The USFDA action levels are among the ecological and human health risk criteria used by the USEPA and USACE in their review of actual bioaccumulation test results prior to their determination of suitability for ocean disposal pursuant to Section 103 of the MPRSA.

TBP is a means to predict contaminant concentrations in tissues of test marine invertebrate species following exposure to marine sediment. The TBP was developed by USEPA and USACE to assist in their regulatory determination of the suitability of dredged material for unconfined ocean disposal (USEPA and USACE 1991). The TBP is calculated by applying project specific bulk chemistry and total organic content results of sediment samples to the lipid (fat) content of the selected test species. Organisms of interest for purposes of this TBP evaluation are *Nereis virens*, an omnivorous polychaete (worm), and *Macoma nasuta*, a deposit-feeding clam. These species were also previously used in the actual bioaccumulation testing at NAVSTA Mayport in 2002 as part of the MPRSA Section 103 Evaluation for maintenance dredging (Anamar Environmental Chemistry, Inc. 2002). Both are USEPA identified benchmark species for bioaccumulation testing (USEPA 1998a).

The TBP calculations for the sediment quality results from the proposed deepening project are provided in Appendix A.3. The calculations used the average bulk sediment chemistry results from the five samples taken in the basin that essentially replicates the way discreet samples are composited (combined) before testing for MPRSA Section 103 bio-effects protocols. The following provides a summary of the findings for two types of contaminants.

TBP-PAHs

Several analytes of PAHs were detected in turning basin sediment samples in both the recent sampling program for the proposed deepening and for the 2002 tests for maintenance dredging of the turning basin. The TBP calculated for the PAH analytes detected in the recent sampling program ranged from 0.4 to 27 parts per billion (ppb) in clam tissue (see Appendix A.3). This compares with the actual bioaccumulation results for samples taken for the 2002 maintenance dredging MPRSA Section 103 evaluation, which samples ranged from 35 to 830 ppb in clam tissue (Anamar Environmental Chemistry, Inc. 2002). This indicates that sediment of the deeper turning basin evaluated in the recent sampling program potentially has less bio-effects than maintenance dredge material that has received approvals for ocean disposal.

TBP-PCBs

PCBs were detected in low concentrations in the turning basin sediment samples collected for the proposed deepening project. No PCBs were detected in the testing conducted prior to maintenance dredging projects for the turning basin. The TBP in clams for PCBs ranged from 0.08 to 0.45 ppb (0.00008 to 0.00045 ppm), which is well below the USFDA shellfish action limit for PCBs of 2 ppm (USFDA 2001).

MPRSA Section 103 Bioassay and Bioaccumulation Test Results (NAVSTA Mayport Turning Basin and Entrance Channel)

As noted in Section 2.1.3.2, the actual third tier bioassay and bioaccumulation tests of the sediment were conducted by USACE after publication of the DEIS. All bioassay and bioaccumulation testing was conducted in compliance with USACE and USEPA's *Evaluation of Dredged Material Proposed for Ocean Disposal (Testing Manual)*, or "Green Book," (USEPA and USACE 1991) and USACE/USEPA, Region 4 Regional Implementation Manual (USEPA and USACE 1993). These tests are required by USEPA during the permitting process and must be verified by the USACE and USEPA before the dredged material is deemed suitable for ocean disposal in an ODMDS. The proposed dredging area was divided into the eight zones shown in Figure 3.1-7. Individual core samples of sediments were collected within each of the eight zones and composited into eight samples for bio-effect testing. The 10-day, solid phase bioassays are acute tests using organisms that are representative of the benthic environment at the ocean disposal site. Two test species are placed in samples of the dredge material. The test species used were a Mysid shrimp (*Americamysi bahia*) and benthic amphipod (*Lepteochirus plumulosus*). After 10 days, the surviving numbers of species are counted. Survival rates are compared between project dredged material and species placed in sediment from a reference site near the disposal site (MATEC 2008).

Dredged material does not meet benthic toxicity criteria for ocean disposal when bioassay organism mortality (1) is statistically greater than in the reference sediment and (2) exceeds mortality in the reference sediment by at least 10 percent (or a value that is in accordance with approved testing methods, e.g., 20 percent for amphipod bioassays) (USEPA and USACE 1991).

After considering this guidance, one of the following conclusions is reached for the acute toxicity of contaminants in the dredged material:

- Mortality in the dredged material is not statistically greater than in the reference sediment, or does not exceed mortality in the reference sediment by at least 10 percent (or 20 percent for amphipods). Therefore, the dredged material meets criteria for benthic toxicity. If so, no further information is necessary to determine compliance with the criteria for benthic toxicity, but bioaccumulation also has to be considered.

- Mortality in the dredged material is statistically greater than in the reference sediment and exceeds the mortality in the reference sediment by at least 10 percent. In this case, the dredged material exceeds the limiting permissible concentration and does not comply with the benthic bioassay criteria (USEPA and USACE 1991).

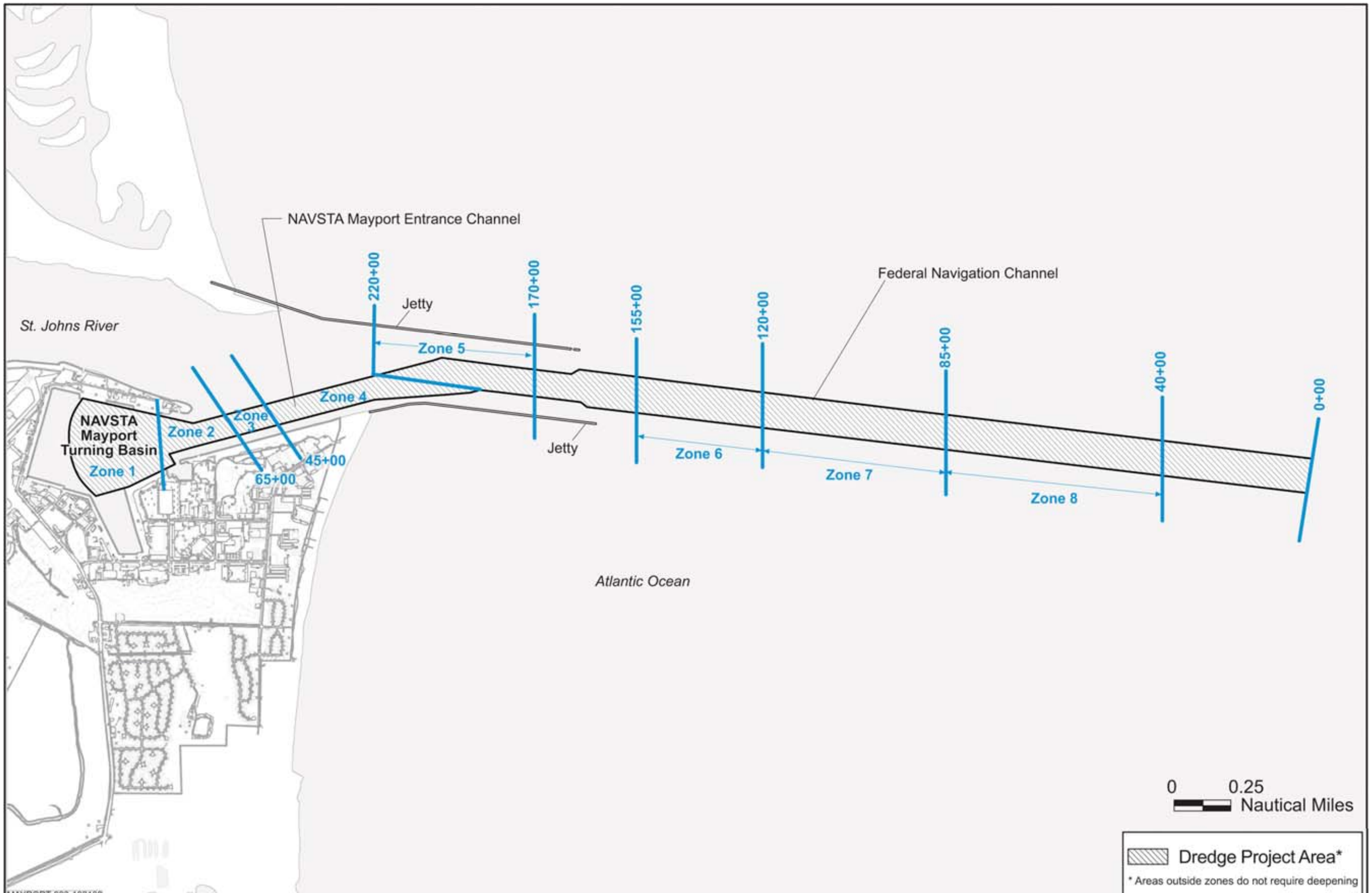


Figure 3.1-7 Approximate Location of MPRSA Section 103 Evaluation Sampling Zones

All eight of the sample zones met the criteria for the Mysid shrimp bioassay. Seven of the eight zones met the criteria for the bentic amphipod bioassay. One sample in Zone 4 (see Figure 3.1-8) had a 70 percent survival rate for the amphipod 10-day test. The survival rate in the reference sample (located near the Jacksonville ODMDS) was 91 percent for the amphipod 10-day test. Additionally, the organism mortality results were statistically greater than in the reference site (MATEC 2008). A 71 percent survival rate is needed for passing the test (Ross 2008, USEPA and USACE 1991). Therefore, the proposed dredge material within the proposed dredged envelope represented by this sample in Zone 4 failed to meet the bioassay criteria and is not suitable for ocean disposal. Zone 4 represents approximately 315,000 cy of the total 5.2 million cy project. The material in Zone 4 is predominately coarse sand with some clay and silt. Chemical results do not indicate a reason for the bioassay failure. Based on the bioassay test results, material type, and chemical data, it is likely the failure was due to factors other than contamination of the sediments (Ross 2008). This zone is being re-tested for the bioassay portion of the Section 103 requirements. The Section 103 Evaluation was initiated prior to the issuance of the FEIS and will be finalized as part of the project permitting process. USACE Jacksonville District provides public access to Section 103 testing results via the website: http://planning.saj.usace.army.mil/envdocs/envdocsb.htm. Once available, the Section 103 testing results completed during the permitting phase will be posted at this site, under Duval County.

3.1.5.2 Federal Navigation Channel

More than 50 percent of the sediment from the proposed deepening project would come from the federal navigation channel. Currently maintained at a congressionally authorized depth of -42 ft MLLW, the federal navigation channel (Bar Cut 3 Area 1 and Area 2) would be deepened up to -54 ft MLLW (see Figures 2.3-1, 2.3-2 and 2.3-3). From the NAVSTA Mayport entrance channel, the federal navigation channel extends more than 3 miles until naturally deep water is available. This area is the interface of the mouth of the St. Johns River and the Atlantic Ocean.

<u>Physical Characteristics of Sediment to be Dredged (Federal Navigation Channel)</u>

The USACE undertook a geotechnical investigation of this area in 1994 when evaluating a similar proposed dredging project (USACE 1994a). The physical sediment profiles reported in the 1994 investigation are relevant as the sediment below existing maintenance depths is not subject to potential alteration as are the surficial sediment layers.

Although sand is the predominant sediment type in the federal navigation channel Bar Cut 3, a mix of sediment types is also evident. Of the 30 geotechnical sediment samples taken in the 1994 study, 20 sample stations were located in the outer portion of the federal navigation channel (Bar Cut 3 Areas 1 and 2). Sand of differing grain sizes, silt, silty/clay and clay were evident in the boring logs of the 1994 investigation. Additionally, sand was encountered at different depths in the sediment profile. Sand or silt was typically encountered in the upper layers. The sand layers ranged from 2 to 14 ft with characterization as silty sand; clayey sand; and sand. Sand or clay was typically evident in deeper layers from -48 to -56 ft below MLLW.

Thirteen additional vibracore sediment samples were collected in June 2007 in the entrance channel and federal navigation channel to verify physical characteristics of the sediments. The location of each of these samples is shown in Figure 3.1-8: nine samples were located in the federal navigation channel, two were located at the transition between the federal navigation channel and the NAVSTA Mayport entrance channel, and two were located in the eastern end of the NAVSTA Mayport entrance channel. The cores were taken to depths ranging from -47.5 ft to -55.5 ft MLLW, with 9 of the 13 cores exceeding a depth of -53 ft MLLW. Unlike the incremental grain size distribution results that are rendered with use of a split spoon drill rig (18-inch long sediment samples) in the turning basin investigation, the samples in the outer channels were tested for the full length of the vibracore sample. Sand mixed with silt and/or clay was typically encountered in the upper layers of the core and clay was typically found in the deeper layers.

Figure 3.1-9 presents the grain size distribution for the vibracore samples taken in June 2007. The lower sample numbers (NV-1 through NV-4) are from the NAVSTA Mayport entrance channel/federal channel interface and higher sample numbers (NV-5 through NV-13) are from the outer federal navigation channel. Sample 3a was a shallow sample taken near Sample 3 while Sample 12a was a sub-sample of Sample 12 that was almost exclusively sand. The amount of sand in the samples ranged from 11 to 96 percent, clay from 2 to 66 percent; and silt from 1 to 27 percent. The average grain size distribution of the collected sediment was 9 percent silt, 22 percent clay, and 69 percent sand, although much of the sand was in mixture.

Sub-bottom Profiling Investigation (Federal Navigation Channel)

The October 2007 acoustical survey of the federal navigation channel from the NAVSTA Mayport entrance channel to the open ocean involved the full width and length of the proposed deepening footprint. The interpretation of the data included correlation with the geotechnical borings and cores described above. An area in the federal navigation channel (Bar Cut 3, Area 1) was identified as having layers of sand that could be quantified. In Bar Cut 3, Area 1, approximately 115,000 cy of sand is estimated to occur within the proposed dredge prism. The thickness of sand layers range from 2 to 12 ft.

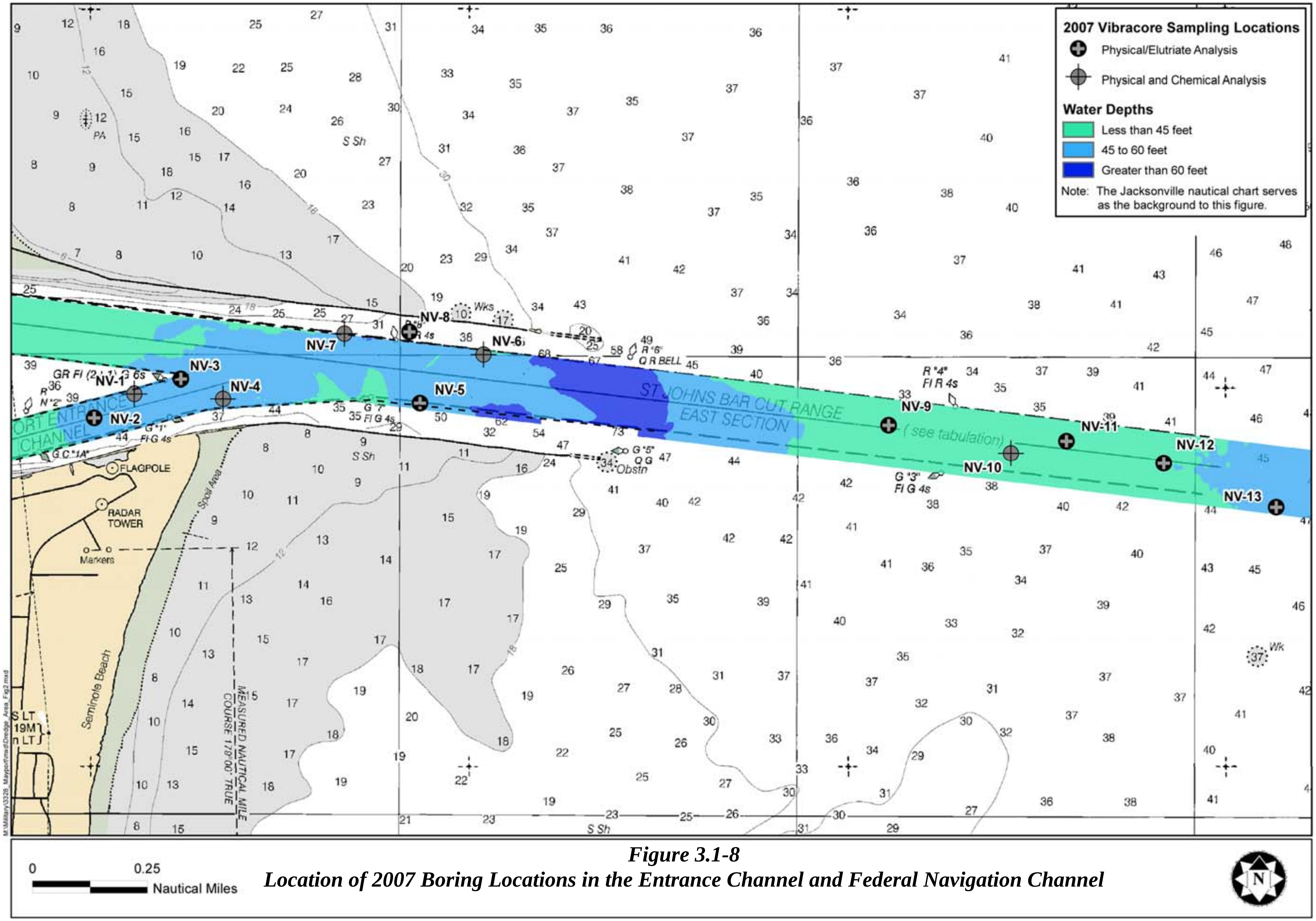


Figure 3.1-8
Location of 2007 Boring Locations in the Entrance Channel and Federal Navigation Channel

The range of silt or silty clay overburden above the sand layers is from 0 to 2.5 ft. The complete results of the sub-bottom profiling are provided as Appendix A.4.

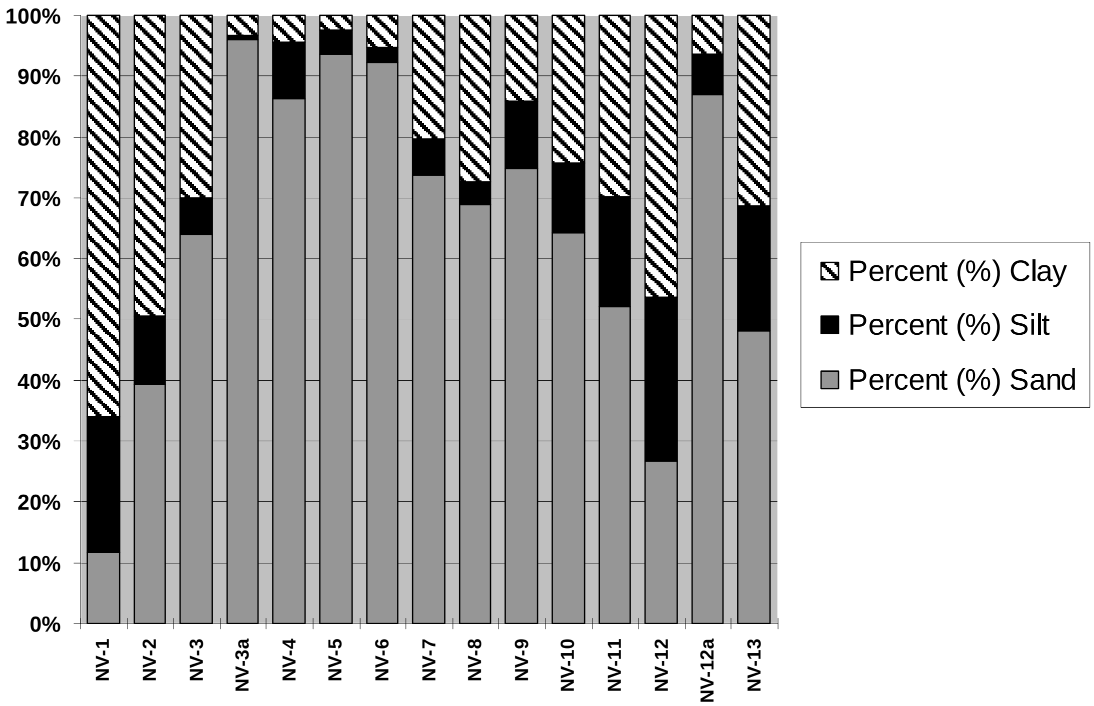


Figure 3.1-9 Particle Size Distribution, NAVSTA Mayport Entrance Channel and Federal Navigation Channel Sediment Samples

<u>Chemical Analyses of Sediment Samples (Federal Navigation Channel)</u>

Bulk chemical analyses were conducted on five of the 13 samples collected in the federal navigation channel and NAVSTA Mayport entrance channel in June 2007. While there were detectable amounts of metals, PAHs, and PCBs, the amounts typically were low and below the ERL sediment quality guidelines published by NOAA. Only one sampling location, NV-10, from the outer federal navigation channel contained a measurable amount of any PCB parameters. These measurable amounts, when totaled (62.1 ppb) exceeded the ERL level (22.7 ppb), but not the ERM level (180 ppb). See Appendix A.3 for full discussion of testing results. This result may be an anomaly, given the uniqueness of the results compared to all the other sample results and the relatively high percentage (64 percent) of sand in the sample. Contaminants are more likely to be found in samples with high percentages of silt rather than sand.

Elutriate samples taken in the federal navigation channel and NAVSTA Mayport turning basin and entrance channel as part of the Section 103 Evaluation were tested for PCB congeners. Trace amounts of PCBs were detected in all samples but at very low levels. The highest detected level was 13.8 nanograms per liter (ng/l, or parts per thousand [ppt]) in zone 1. This test result is less than the Florida Class III marine water quality criteria of 0.03 µg/l (ppb) and comparable to the 4.7 ng/l found in the reference sample.

In the past, dredged material from the federal navigation channel Bar Cut 3 has been taken to the Jacksonville ODMDS, or used for beach nourishment if beach compatible sand is dredged. Previous sediment tests in the federal navigation channel, including the results from the USACE 1994 investigation (USACE 1994a), revealed low concentrations of contaminants. The 1994 survey identified relatively high levels of aluminum in the sediment, reflecting the clay present in the samples. Other metals were either not detected or were present at low levels. Additionally, past tests for both pesticides and PCBs revealed test results below detection limits of the laboratories. The 2007 test results are consistent with past testing results, indicating generally clean sediments in the NAVSTA Mayport entrance channel and federal navigation channel.

<u>Theoretical Bioaccumulation Potential (Federal Navigation Channel)</u>

TBP analysis for federal navigation channel (Bar Cut 3) sediments was performed for two contaminants using the average of bulk sediment chemistry results from the five June 2007 samples. The following provides a summary of the findings for two types of contaminants.

TBP PCBs

Presence of PCBs were identified in one sample test result in the federal navigation channel (i.e., sample NV-10). The other four channel samples yielded minimal to no indication of PCBs. TBP values for PCBs in the federal navigation channel sediments were 22.6 ppb (0.0226 ppm) for total PCBs. These potential bioaccumulated levels of PCBs are well below the USFDA action limit of 2 ppm for PCBs in fish and shellfish tissue (USFDA 2001).

Pesticides

Pesticides were only detected in federal navigation channel sediments, with Aldrin having the highest TBP value of 67.6 ppb (0.0676 ppm). The results of the TBP for pesticides are well below fish and shellfish tissue USFDA action limits of 0.3 ppm for Aldrin and dieldrin and 5 ppm for Dichloro-Diphenyl-Trichloroethane (DDT) (USFDA 2001).

MPRSA Section 103 Bioassay and Bioaccumulation Test Results (Federal Navigation Channel)

As previously mentioned, third tier bioassay and bioaccumulation tests of the sediment were conducted after publication of the DEIS. These tests are required by USEPA during the permitting process and must be verified by the USACE and USEPA before the dredged material is deemed suitable for ocean disposal in an ODMDS. USACE has determined that all proposed dredged material in the federal navigation channel (see Zones 5-8 on Figure 3.8-1) met MPRSA Section 103 parameters and is suitable for ocean disposal. The results of the MPRSA Section 103 Evaluation are discussed in further detail in Section 3.1.5.1.

3.1.5.3 Jacksonville ODMDS

The Jacksonville ODMDS is located approximately 5.5 nm from NAVSTA Mayport and continues to be the predominant site for the placement of maintenance dredged material from the turning basin, entrance channel, and that portion of the federal channel near NAVSTA Mayport (see Figure 2.3-1). Under the MPRSA, USEPA and USACE are responsible for managing and monitoring the ODMDS. During both a 1995 survey and a 1998 survey, sediment at all Jacksonville ODMDS sample stations was predominantly sand (greater than 90 percent). Overall, there was little change in sediment particle size outside the disposal site boundaries. The vast majority of chemical constituents at the ODMDS were either below laboratory analytical detection limits or were at very low concentrations. Zinc concentrations were above normal in 1998 at two locations, but were well below screening values. Nutrient levels in sediment are very low or below analytical detection limits. Total phosphorus levels ranged from 83 milligrams per liter (mg/l) to 1,500 mg/l in various surveys and showed very little change between surveys. Nutrient concentrations between sample stations showed no discernable pattern, with similar numbers both inside and outside the ODMDS. Extractable and volatile organics were not detected in disposal area sediments.

Another measure of sediment quality is the health of the habitat for the presence of macrobenthic (organisms living on the ocean surface that are greater than 1 mm long) species. Samples of macrobenthos were taken in the 1995 and 1998 both inside and immediately adjacent to the ODMDS and are reported in terms of taxa (i.e., a plant or animal in any group or category including species, genus, family, etc.). In general, taxa were very diverse and evenly distributed both inside and outside the site with 8,214 individual organisms representing 446 taxa found in 1995, and 7,861 individual organisms representing 434 taxa found in 1998. In both 1995 and 1998, macrobenthos at all sampling stations were extremely diverse with an equitable distribution of taxa relative to other assemblages of organisms that live within the sediment in the region. In terms of both number of individuals and number of species, polychaetes (marine worms) were the most abundant (USEPA 1999b).

3.1.5.4 Fernandina Beach ODMDS

The Fernandina ODMDS is a 4 square nm (2 nm by 2 nm square) area with depths ranging from -40 ft to -68 ft MLLW. As shown in the top graph on Figure 3.1-10, bottom sediments at the Fernandina ODMDS are predominantly sand with some silt, clay, and gravel fractions. Sediment texture data at this ODMDS from 1989 and 2005 data have been compared. Sediment composition at five stations sampled outside the ODMDS in 1989 was variable: sand was found at two stations, silty sand at one, and gravelly sand at one. Sediment composition at the six stations outside the ODMDS sampled in 2005 was greater than 97 percent sand. Sediment at sampling stations within the ODMDS in 1989 was also variable: sand at one station, slightly gravelly sand at two stations, and gravelly sand at two stations. In 2005, three stations had sandy sediments, two had gravelly sand sediments, and one had sandy gravel sediments.

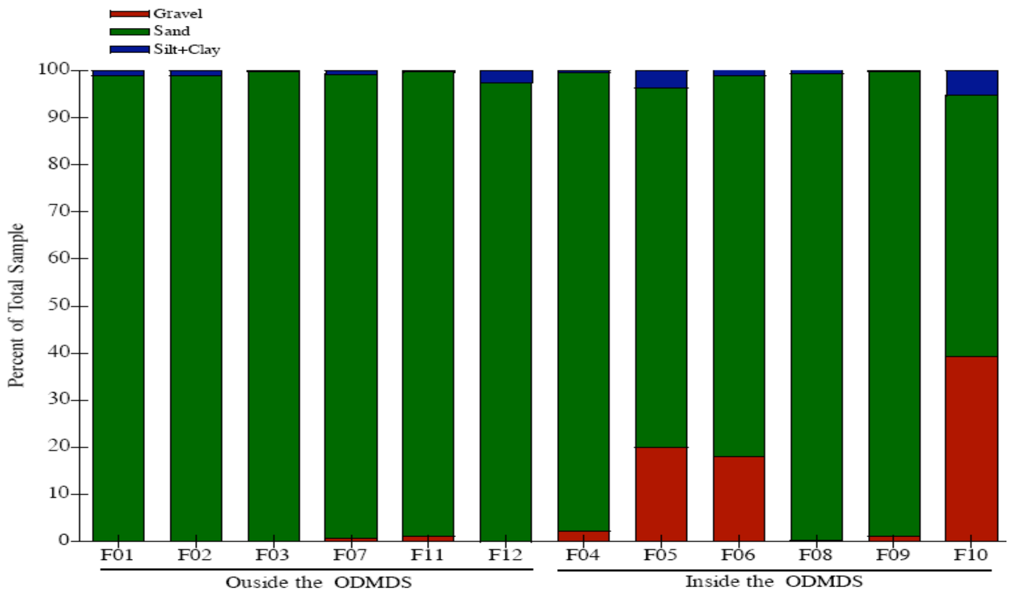
The dominant macrobenthic taxa collected at and near the Fernandina Beach ODMDS in 2005 and 1989 were similar. As depicted on the lower graph of Figure 3.1-10, 2005 sampling shows an abundance of species diversity at the ODMDS in terms of macroinvertebrates (animals without backbone living on the ocean bottom). As reported in 1989, stations inside the ODMDS had significantly higher species richness and density than stations outside the ODMDS; however by 2005, species richness was higher both inside and outside the ODMDS than in 1989 (USEPA 2006b).

3.1.6 ODMDS Capacity

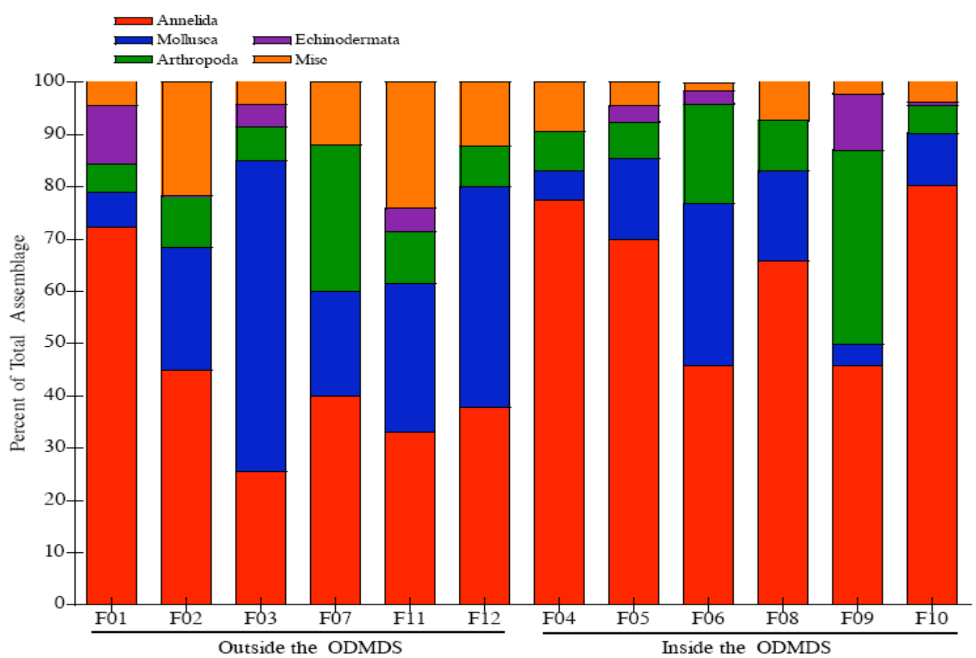
3.1.6.1 Jacksonville ODMDS

Between 1996 and 2006, a total of approximately 4.8 million cy of dredged material was placed at the ODMDS, of which 82 percent was generated from NAVSTA Mayport maintenance dredging (USEPA and USACE 2007). The remainder was generated from maintenance dredging of the federal navigation channel. In 2007 and 2008, an additional 1.1 million cy of material was placed at the ODMDS, including approximately 510,000 cy for the Federal navigation project and approximately 635,000 for NAVSTA Mayport maintenance. (For more detail, see Table 6.1-1 in Section 6.1, which provides a historic breakdown of the volume of material placed at the Jacksonville ODMDS.)

Bathymetrical mapping, which compiles information on depth of the ocean surface into a topographical map, illustrates the features of the ODMDS. Recent mapping (June 2007) was completed for both Jacksonville and Fernandina ODMDSs and is depicted in three-dimensions in Figure 3.1-11.



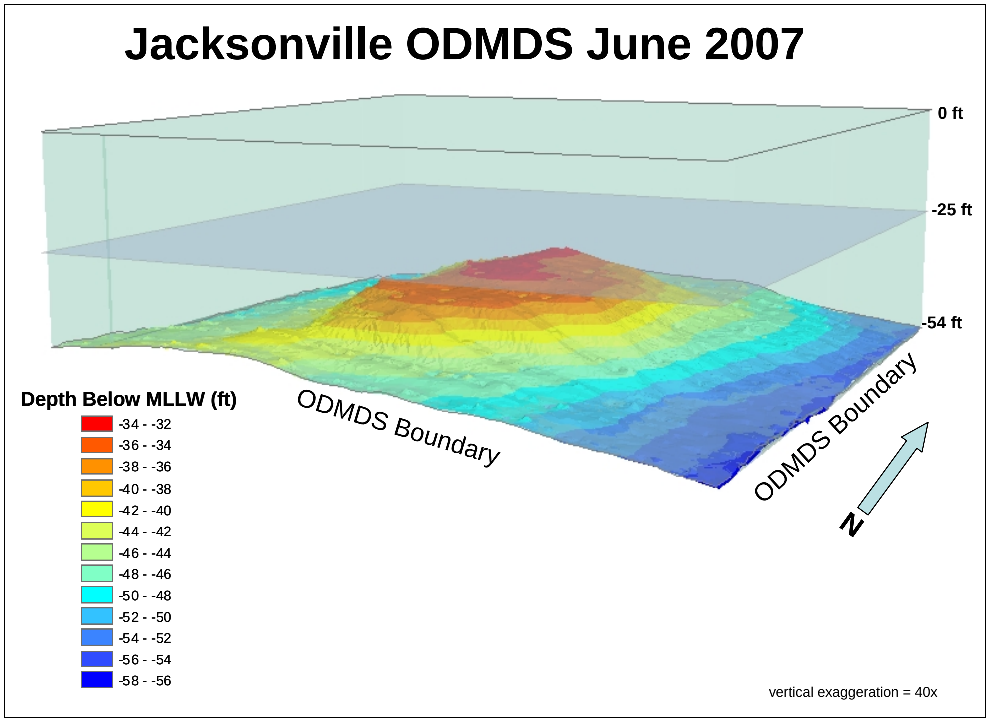
Sediment texture for the Fernandina ODMDS, 2005



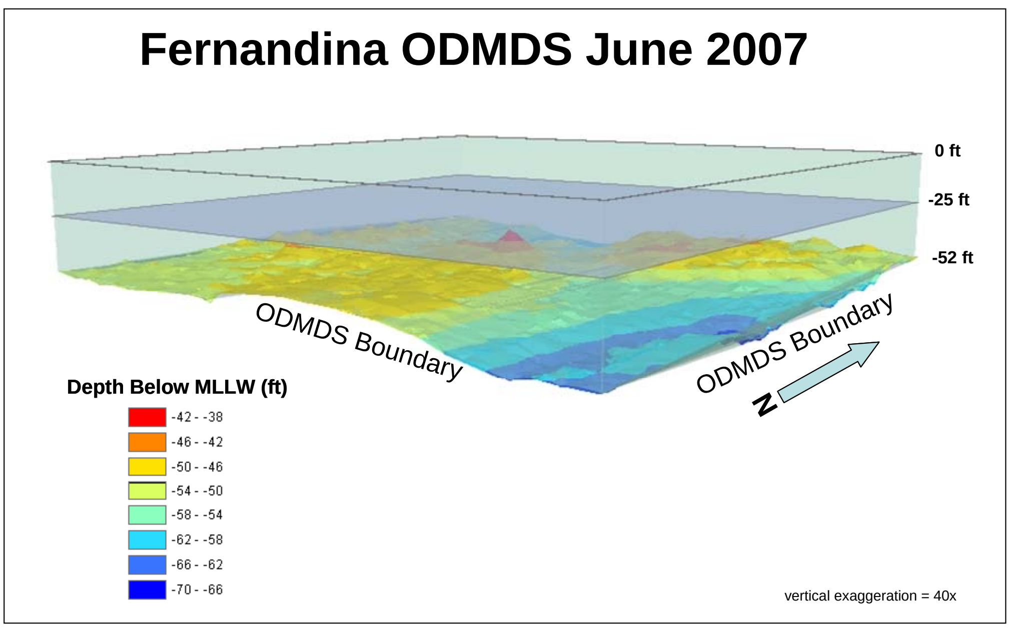
Abundance of major macroinvertebrate taxa for the Fernandina ODMDS, 2005

Source: USEPA 2006a

Figure 3.1-10 Sediment Characteristics, Fernandina ODMDS



View of the Jacksonville ODMDS from the southeast. Seabed depiction is based on June 2007depth survey data. The 25-ft water depth is shown for reference.



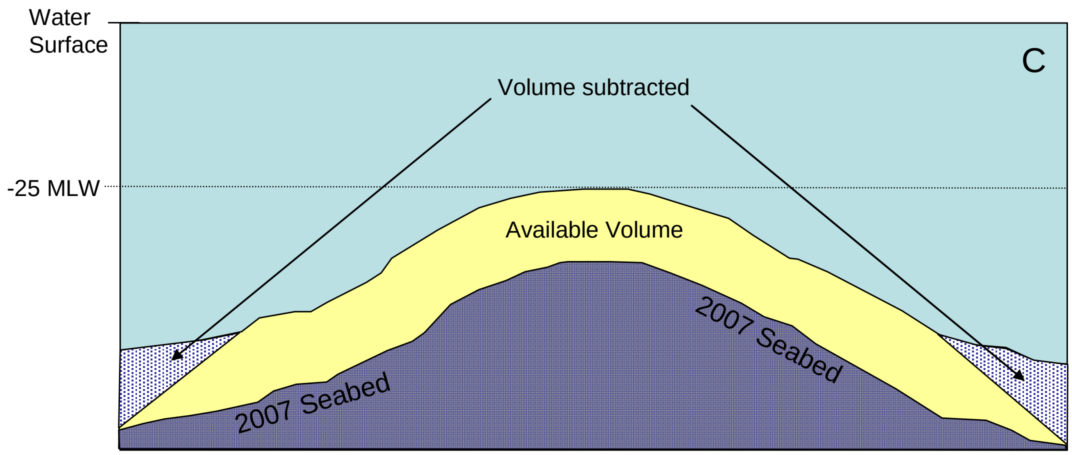
View of the Fernandina ODMDS from the southeast. Seabed depiction is based on June 2007 depth survey data. The 25-f-t water depth is shown for reference.

Figure 3.1-11 Bathymetry of Jacksonville and Fernandina ODMDSs (2007)

As shown, the Jacksonville ODMDS contains a mound centered within the one square mile (one nm by one nm) site boundary that rises approximately 15 ft above the surrounding seabed.

The USEPA and USACE are responsible under the MPRSA to manage and monitor the ODMDS. The Jacksonville ODMDS SMMP addresses monitoring and management options at the Jacksonville ODMDS. The existing SMMP for the Jacksonville ODMDS was completed in 1997 and was updated in 2007 (USEPA and USACE 2007). Some of the material is known to disperse from the disposal mound, while much of the sediment remains in place consolidating and creating an irregularly shaped topography with relative hills and valleys. The USEPA and USACE manage the site to keep disposed materials within the boundaries of the one square mile area of the ODMDS and the peak of the mound below the -25 ft depth to avoid becoming a navigation hazard. The annual disposal restriction at the ODMDS is established at 2 million cy (USEPA and USACE 2007).

As part of the DEIS, calculations were completed to estimate the capacity available for additional dredged material. Both a low and a high volume calculation were completed. The low volume estimate assumes that dumping would continue as it has in the past with minimal attempt made to maximize the available space. The low volume estimate represents the minimum available space at the ODMDS. The high volume estimate assumes that future disposal at each site would be accomplished using a disposal management approach where dredge disposal barges place their loads in predetermined locations to maximize the space remaining between the present seabed and the -25 ft minimum navigation depth specified in the SMMP. The high volume estimate represents the maximum available space for dredge material. In practice, achieving the high volume estimate would be difficult, and the actual available capacity would likely fall within the low to high estimate range. Figure 3.1-12 conceptualizes low volume estimate of remaining dredge volume capacity, shown as the layer of material immediately above the 2007 seabed. Using this approach, the remaining capacity for dredged material at the Jacksonville ODMDS ranges from the low estimate of 9.3 million cy to the high estimate of 25.4 million cy. For more details, see Appendix A.2.



Low volume calculation is determined in several steps. First, the 2007 seabed surface is translated vertically until its shallowest point reaches 25 ft below the water surface. Next, the volume between the 2007 surface and the translated surface is calculated. Then a fraction of the volume is removed from the perimeter of the ODMDS to maintain a maximum 30° slope at the edges to keep within the disposal site boundary.

Figure 3.1-12 Conceptual Depiction of Remaining ODMDS Capacity

3.1.6.2 Fernandina Beach ODMDS

The ODMDS offshore Fernandina Beach is a 4 square nm (two nm by two nm square) area with depths ranging from -40 ft to -68 ft MLLW. The site has been used since 1987 and approximately 600,000 cy per year from the Kings Bay entrance channel is placed there. From 1987 to 1998, approximately 10.5 million cy were placed at this ODMDS and 90 percent of that dredged material came from the entrance channel for the Navy Submarine Base Kings Bay, Georgia (see Table 6.1-2 in Section 6.1 for more detail). Recent (June 2007) bathymetry of the Fernandina ODMDS is depicted in three-dimensions in Figure 3.1-11. As shown, the Fernandina ODMDS contains irregularly distributed mounds within the site boundary that rise approximately 10 to 15 ft above the surrounding seabed.

The USEPA and USACE are responsible under the MPRSA to manage and monitor the ODMDS and the SMMP addresses monitoring and management options at the Fernandina ODMDS. The existing Fernandina SMMP will be updated in 2008. The 2008 update will include an estimate of the total capacity of the four square nm (two nm by two nm) ODMDS for the placement of dredged material. Like the Jacksonville ODMDS, the USEPA and USACE manage the site to keep disposed materials within the boundaries of the ODMDS and the peak of the mound below the -25 ft depth to avoid becoming a navigation hazard. The existing SMMP identifies a requirement to perform modeling for proposed projects exceeding 950,000 cy to verify an appropriate buffer exists to contain the initial disposal mound within the ODMDS boundaries. Low and high volume capacity estimates calculated as part of this EIS range from the low volume estimate of 64.8 million cy to the high volume estimate of 142.3 million cy. Comparatively, the Fernandina ODMDS provides much greater capacity than the Jacksonville ODMDS. For more details see Appendix A.2.

3.2 LAND AND OFFSHORE USE

Land use refers to modification of land for human purposes. Land use primarily serves human habitation and economic purposes, but it also includes lands that are set aside for recreation and conservation purposes. The attributes of land use include patterns of land jurisdiction, land ownership; and the types of activities that occur on lands (agriculture, residences, industries, recreation, etc.). Land uses are regulated by management plans, policies, ordinances and regulations that determine the types of uses that are allowable. Where special use areas have been designated, such as parks and preserves, land and/or natural resource management plans generally provide guidance for types of uses consistent with the designated special use area purposes. Natural resource uses include recreation and commercial uses of the land and water resources for human purposes. The coastal zone discussion specifically refers to compliance with the Coastal Zone Management Act (CZMA) of 1972 (16 U.S. Code [USC] § 1451, et seq., as amended). In accordance with Section 307 of the CZMA and 15 CFR 930 subpart C, Federal agency activities affecting a land or water use or natural resource of a state's coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state's coastal management program (NOAA 2004).

This discussion focuses on those aspects of land and natural resource management and use that are potentially affected by the proposed action and alternatives. Natural resource management use in the northeast Florida region is discussed first and is presented at a level of detail that provides general context for the ROI. The natural resource use study area includes the St. Johns River and offshore commercial and sport fishing areas. The detailed land use study area includes NAVSTA Mayport and lands within a 2 mile radius of the main portion of the installation boundary. The ROI for coastal zone consistency analysis on land is the area of potential development at NAVSTA Mayport, as this is the land area where the federal action subject to consistency determination is proposed. The seaward boundary of the coastal zone study area is defined as 3 nm into the Atlantic Ocean relative to the area where dredging activities would occur under eight of the action alternatives.

3.2.1 Regional Land Use

NAVSTA Mayport is located in northeast Florida (see Figure 1.1-1) in an area informally referred to as the "First Coast," so named because of its proximity to the Atlantic Ocean and because it was the first site settled by Europeans in North America. The development patterns in this area over the past 30 years have directed growth along major transportation corridors with job centers at one end of the corridor, residential land use at the other end, and retail and support commercial land uses in between. Much of the development in the area has followed natural amenities, including the Atlantic Ocean and the St. Johns River; these two water bodies meet at NAVSTA Mayport (DoN 2003). Both amenities serve an important role in the land and natural resource management and use of the region and the NAVSTA Mayport vicinity, in particular.

NAVSTA Mayport is located within the consolidated geopolitical boundaries of Duval County and City of Jacksonville. The City of Atlantic Beach is located approximately 3 miles south of the installation. The Village of Mayport borders the installation to the northwest and is situated on a narrow strip of land along the St. Johns River, northwest of NAVSTA Mayport between Chicopit Bay and the ferryboat station (see Figure 1.1-1). The City of Jacksonville has established the Village of Mayport Overlay District to recognize the Village of Mayport area as a unique residential and commercial community within Duval County. The southern edge of NAVSTA Mayport is bordered by State Road A1A, Wonderwood Drive, and Kathryn Abbey Hanna Park (City of Jacksonville). North of the St. Johns River are Huguenot Park (City of Jacksonville), Little Talbot Island State Park, and Fort George Island Cultural State Park. Much of the land to the north of the installation is part of the Timucuan Ecological and Historic Preserve (National Park Service). The boundaries of the Timucuan Ecological and Historic Preserve also extend onto the southeastern portion of NAVSTA Mayport and overlap with approximately 1,150 acres of the installation (DoN 2002c) (see Figure 1.1-2).

The Northeast Florida Regional Planning Council, an association of seven county governments: Duval, Clay, St. Johns, Nassau, Putman, Flagler, and Baker counties, is a multipurpose regional entity that plans for and coordinates intergovernmental solutions to growth-related problems on greater-than local issues. The Council has created a Strategic Regional Policy Plan for the region to be used for planning purposes only, but not for permitting or regulatory purposes. Five strategic subject areas are addressed in the plan: affordable housing, economic development, emergency preparedness, natural resources of regional significance, and regional transportation (Northeast Florida Regional Planning Council 1997).

3.2.2 Detailed Land Use Study Area

Within the detailed land use study area (2 miles from the installation boundary), existing land use was inventoried and mapped. As shown in Figure 3.2-1 and Table 3.2-1, there are nine major land use categories within this 8,717-acre study area. The most prevalent land uses by acreage are lands that are

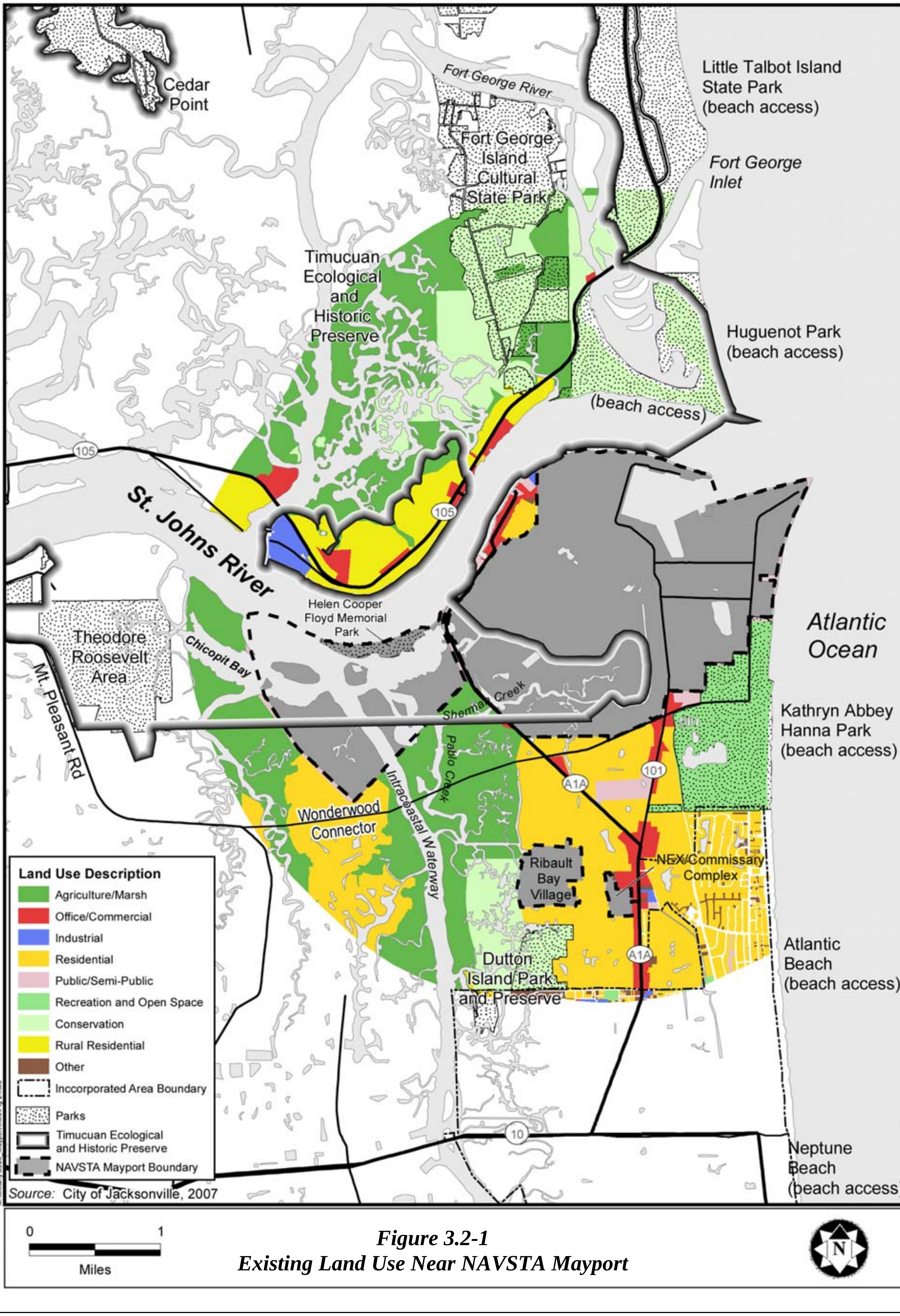


Figure 3.2-1
Existing Land Use Near NAVSTA Mayport

largely undeveloped lands: agriculture/marsh (3,225 acres), conservation (1,788 acres), and recreation and open space (524 acres). Together, these three land use categories account for almost two-thirds of the study area. The distinctions between these land use categories are largely administrative relative to the City of Jacksonville land use and zoning categorizations. The agricultural/marsh land use is applied to those marshland areas that serve an ecological/watershed/wetland function purpose and indicates that the lands are not suitable for development. The conservation category refers to the special management areas of Huguenot Park, Little Talbot Island State Park, Fort George Island Cultural State Park, and Dutton Island Park and Preserve (City of Atlantic Beach and City of Jacksonville 2006). In some cases, land use categorized as conservation expands beyond these park boundaries. The recreation and open space category applies to Kathryn Abbey Hanna Park (City of Jacksonville 2007a, 2007b, and 2007c). These park and beach areas are discussed in more detail in Section 3.2-4. The other category primarily includes vacant, institutional, right-of-way, and mixed use.

Table 3.2-1 Land Uses Near NAVSTA Mayport

Land Use Description	Acreage	Percent of Study Area
Agriculture/Marsh	3,225	37.0
Residential	2,021	23.2
Conservation	1,788	20.5
Recreation and Open Space	524	6.0
Rural Residential	498	5.7
Office/Commercial	311	3.6
Public/Semi-public	213	2.4
Industrial	72	0.8
Other	65	0.7

Source: City of Jacksonville 2007b.

The next greatest share of land use is residential (2,021 acres) and rural residential (498 acres), which together represent nearly 30 percent of the land use in the study area. The distinction between residential and rural residential is largely based on lot size (with rural residential areas having large lot sizes). The rural residential land use areas are located north of the St. Johns River along Heckscher Drive (State Route 105) and include most of Fanning Island. Riverfront homes occur on many lots that extend from south of Heckscher Drive to the north bank of the river. Other residential areas include the Village of Mayport residential area; various City of Jacksonville and Atlantic Beach residential areas south of the installation between the Intracoastal Waterway and the Atlantic Ocean that include apartments, mobile home parks, multi-family dwellings, and single family home neighborhoods; and the Queens Harbor Yacht and Country Club gated community located southwest of NAVSTA Mayport and west of the Intracoastal Waterway. These other residential areas vary from relatively dense multi-family dwellings along Mayport Road to large single family homes on relatively large lots in Selva Marina Country Club. There are two areas of note in the residential area south of NAVSTA Mayport: (1) Ribault Bay Village Family Housing Area, which is accessed from Mayport Road via Assisi Lane, and (2) the 100-acre Fleet Landing Retirement Home, a gated community located east of the intersection of Mayport Road and State Route A1A, originally founded in the 1980s by retired Navy officers (Fleet Landing 2007). The residential area of the Village of Mayport, located to the northwest of NAVSTA Mayport, is an isolated neighborhood that is unique within the region for its historical, social, and cultural significance. Residential densities in the Village of Mayport are mostly low to medium (up to 15 dwelling units per acre).

Most office/commercial land uses in the study area are located along Mayport Road (State Routes A1A/101) and Heckscher Drive (State Route 105). The majority of these land uses are commercial (retail stores, shipyards, general service providers, restaurants, gas stations, etc.) as opposed to offices. The Navy Exchange/Commissary Mall, along with the Pan American Shopping Center that is located between the mall and State Route A1A, is the largest single commercial development. Public/semi-public land uses include four educational facilities including Mayport Middle School, Mayport Elementary School, and Finegan Elementary School. Public/semi-public land use also includes the City of Jacksonville boat ramp at David Wayne Pack Park in the Village of Mayport. Industrial land uses include St. Johns Bar Pilot facility in the southeastern corner of the Village of Mayport and Atlantic Marine shipyard industries (including the drydock facilities used by NAVSTA Mayport) on the western end of Fanning Island. At the intersection of Mayport Road and Wonderwood Drive there is a Jacksonville Electrical Authority (JEA) power substation on NAVSTA Mayport property and a City of Atlantic Beach wastewater treatment plant (categorized as commercial land use). The remaining four land use categories combined account for less that 0.7 percent of the land use in the detailed study area.

In 2001, the Mayport Road Development sub-committee of the Mayport Waterfront Partnership was formed to specifically focus on improvements along the Mayport Road corridor leading to the Village of Mayport. The cities of Atlantic Beach and Jacksonville prepared a Mayport Road Corridor Study that included redevelopment strategies for the commercial parcels. Mayport Road improvements identified in the study include creation of medians, placing overhead utility lines underground, and creating the Mayport Corridor Overlay District to change the development pattern along the corridor. A Community Redevelopment Area has been pursued as an economic development tool, which allows for zoning overlays, eminent domain, and special funding (City of Atlantic Beach and City of Jacksonville 2006, City of Jacksonville 2007f).

The Navy's Air Installation Compatible Use Zone (AICUZ) program is used to plan for compatible land uses within the safety and noise zones associated with the airfield. Under this program, the Navy encourages adjacent communities to plan for compatible development within these zones. The City of Jacksonville has chosen to adopt an ordinance that addresses zoning and land use regulations specifically adjacent to various air installations. The ordinance sets forth standards for land use within such areas and delineates land uses within AICUZ areas as unacceptable for development, conditionally acceptable for new development, or acceptable for development. The ordinance provides for treatment of non-conforming uses and defines acceptable AICUZ land uses and development conditions when appropriate (DoN 2003).

In addition to working with the community with the AICUZ program, the Navy has prepared an Encroachment Action Plan for NAVSTA Mayport. The residential areas south of the installation, Queens Harbor Yacht and Country Club subdivision, at the Village of Mayport, and along Heckscher Drive are not within incompatible noise or safety zones, but present potential encroachment concerns. Portions of the City of Jacksonville Huguenot Park are within the noise and safety zones. Land use at the park is compatible, but there are concerns that there are no safeguards against incompatible future use. Encroachment is further discussed in Section 6.2 in the discussion of cumulative impacts to land use.

Land use controls that apply to this detailed study area include the City of Jacksonville and City of Atlantic Beach zoning and land development regulations. Both cities have developed comprehensive plans to direct land use and development. In general, existing land use in the study area is consistent with the land use zoning established by these cities.

The City of Jacksonville's 2010 Plan contains 15 planning elements, including transportation, land use, conservation, infrastructure, and drainage, among others. The Planning and Development Department's Land Use Division addresses land use issues including developing and maintaining land use policies in conjunction with zoning ordinances. The Land Use Element of the City of Jacksonville 2010 Plan went into effect in 1991. At that time, the city allocated 179,844 acres for residential, commercial, and industrial development; 46,826 acres for public facilities; 89,833 acres limited to agricultural or silvacultural uses, conservation, and recreation; and the remainder allocated to supporting uses such as protected wetlands, roads, and drainage facilities (City of Jacksonville 2004/2005).

The City of Atlantic Beach's 2015 Plan contains 8 planning elements, including land use, transportation, infrastructure, conservation and coastal management, recreation and open space, housing, intergovernmental coordination, and capital improvements. The Planning and Zoning Department administers the City's Comprehensive Plan, the Zoning and Land Development Regulations, as well as other planning projects. The city's first comprehensive plan was adopted in 1990 and has since been amended, most recently in 2004. The city contains approximately four square miles and is nearly fully developed where the predominant land use is residential. Although redevelopment of the city's two main commercial corridors continues to be a strategic planning priority, the city has also created new conservation areas by annexing extensive marsh areas extending westerly to the Intracoastal Waterway. The future land use of these areas is designated as conservation, and two recreational resources have been established, including Tideviews Preserve and Dutton Island Preserve (City of Atlantic Beach 2004).

In 1997, the cities of Jacksonville and Atlantic Beach created the Mayport Waterfront Partnership to bring economic revitalizing to the eastern shore area of Duval County. In 1998, the State of Florida designated Mayport as one of the first three waterfront communities in the State in need of revitalization. The partnership grew into a multi-government agency, business, and community task force. The 25 Waterfront Partnership Board members represent the wide interests of groups such as the U.S. Navy, the National Park Service, local government, business and community groups. In 2001, the Waterfront Partnership wrote and sponsored the establishment of the Village of Mayport Working Waterfront District zoning regulations as part of the City of Jacksonville Code (City of Jacksonville 2006 and 2007d).

3.2.3 On-Station Land Use and Constraints

Existing land uses at the 3,409-acre NAVSTA Mayport are the result of planned development of facilities and activities to support the military mission. In general, administration, maintenance, and repair functions are located adjacent to the waterfront between Maine Street and Delta Piers, providing a logical grouping of activities around the ships and turning basin. Housing and community facilities are separated from industrial areas by the roadway network, administration facilities, and the golf course. Much of the southwestern section of NAVSTA Mayport is open land, including wetland areas. The turning basin is internal to and buffered from the surrounding community by the activities of NAVSTA Mayport. Figure 3.2-2 depicts land use at NAVSTA Mayport according to the following land use categories:

- Mission critical: airfield and waterfront operation;
- Mission support: command and control, logistics, fuels, maintenance, ordnance, public works/utilities, and training; and
- Quality of life: health services, housing, and personnel/community support.

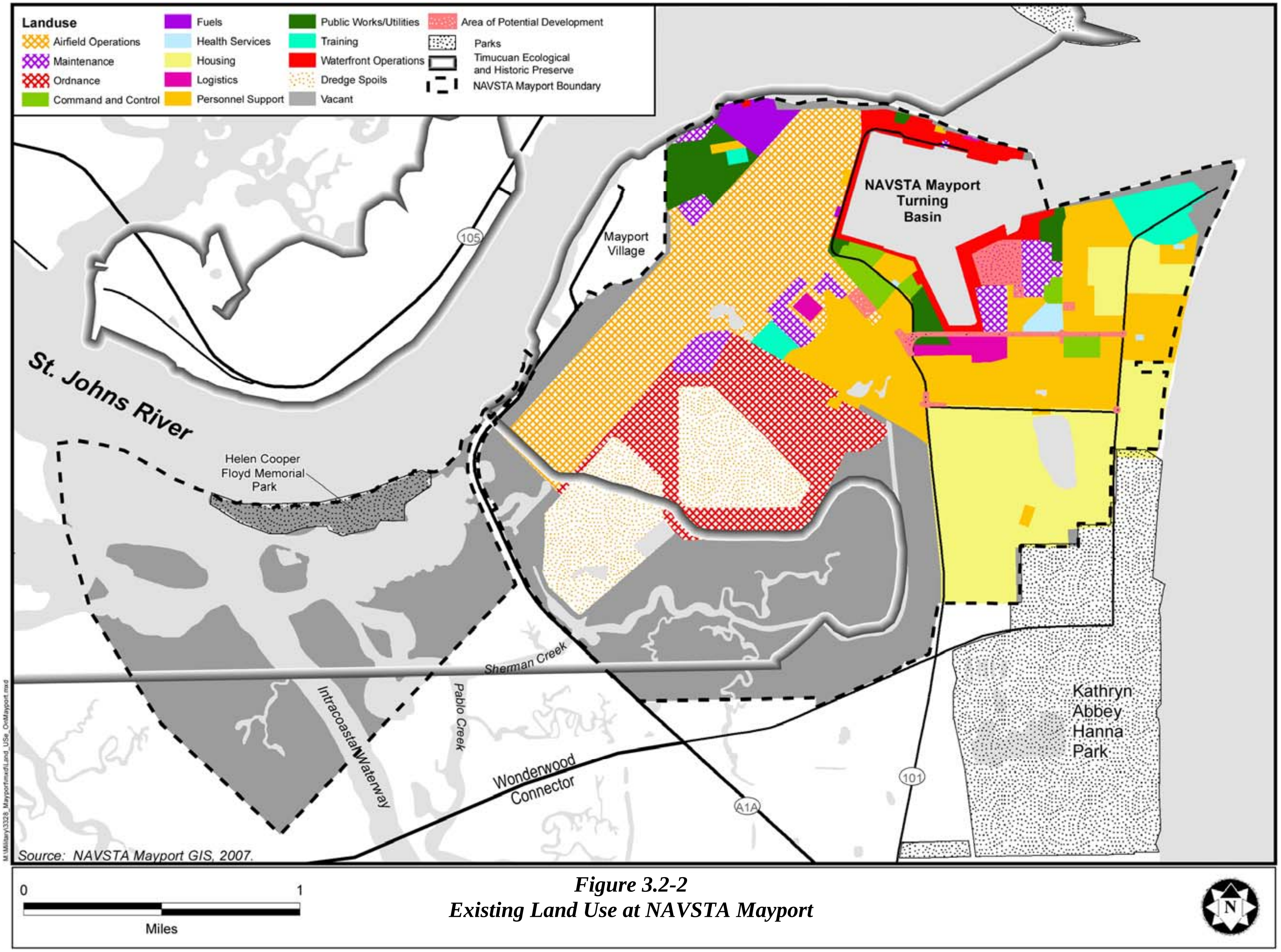


Figure 3.2-2
Existing Land Use at NAVSTA Mayport

In addition, approximately 200 acres of lands at NAVSTA Mayport currently are dedicated to confined disposal facilities for sediment dredged from the turning basin and entrance channel. NAVSTA Mayport is in the process of evaluating the potential to remove, to the greatest extent possible, the dewatered dredge material for beneficial reuse applications (NAVSTA Mayport 2007a). Marshland areas are vacant areas and primarily support conservation purposes. The approximately 33-acre Helen Cooper Floyd Memorial Park (also known as the Little Jetties) is located within the boundaries of NAVSTA Mayport (western portion, just east of the confluence if the Intracoastal Waterway and the St. Johns River) and is leased to the City of Jacksonville. The park primarily supports recreational fishing and offers a pedestrian dock.

The Jacksonville FCA Overview Regional Shore Infrastructure Plan (DoN 2003) provides general land use guidance for NAVSTA Mayport. NAVSTA Mayport's Master Plan addresses orderly development of NAVSTA Mayport in future years. Existing land use patterns and future land use potential is affected by various manmade and environmental constraints to development. The constraints that are most applicable to the proposed action and alternatives are the airfield imaginary surfaces and Accident Potential Zones (APZs), ordnance Explosive Safety Quantity Distance (ESQD) safety zones, Antiterrorism/Force Protection (AT/FP), and aesthetic compatibility considerations and are, therefore, briefly discussed below. Other potential constraints are addressed in other sections of this EIS and include wetlands (see Section 3.3.3), threatened and endangered species habitat (see Section 3.6.3), and contaminated sites (see Section 3.12.2).

3.2.3.1 Airfield Imaginary Surfaces

Airfield imaginary surfaces refers to planes that are established on paper and in mapping programs in relation to an airfield and are used for planning purposes in establishing and applying airfield safety clearances for fixed-wing aircraft and helicopter installations. Based on Federal Aviation Regulation Part 77 and NAVFAC P-971, there are three types of aircraft safety criteria: (1) height restrictions, (2) lateral clearances, and (3) clear zones/takeoff safety zones immediately adjacent to the runway. These restrictions are reflected in the Fixed-Wing and Helicopter Primary Surfaces and Clear Zones and Fixed-Wing Transitional Zone established at NAVSTA Mayport, which are depicted in Figure 3.2-3.

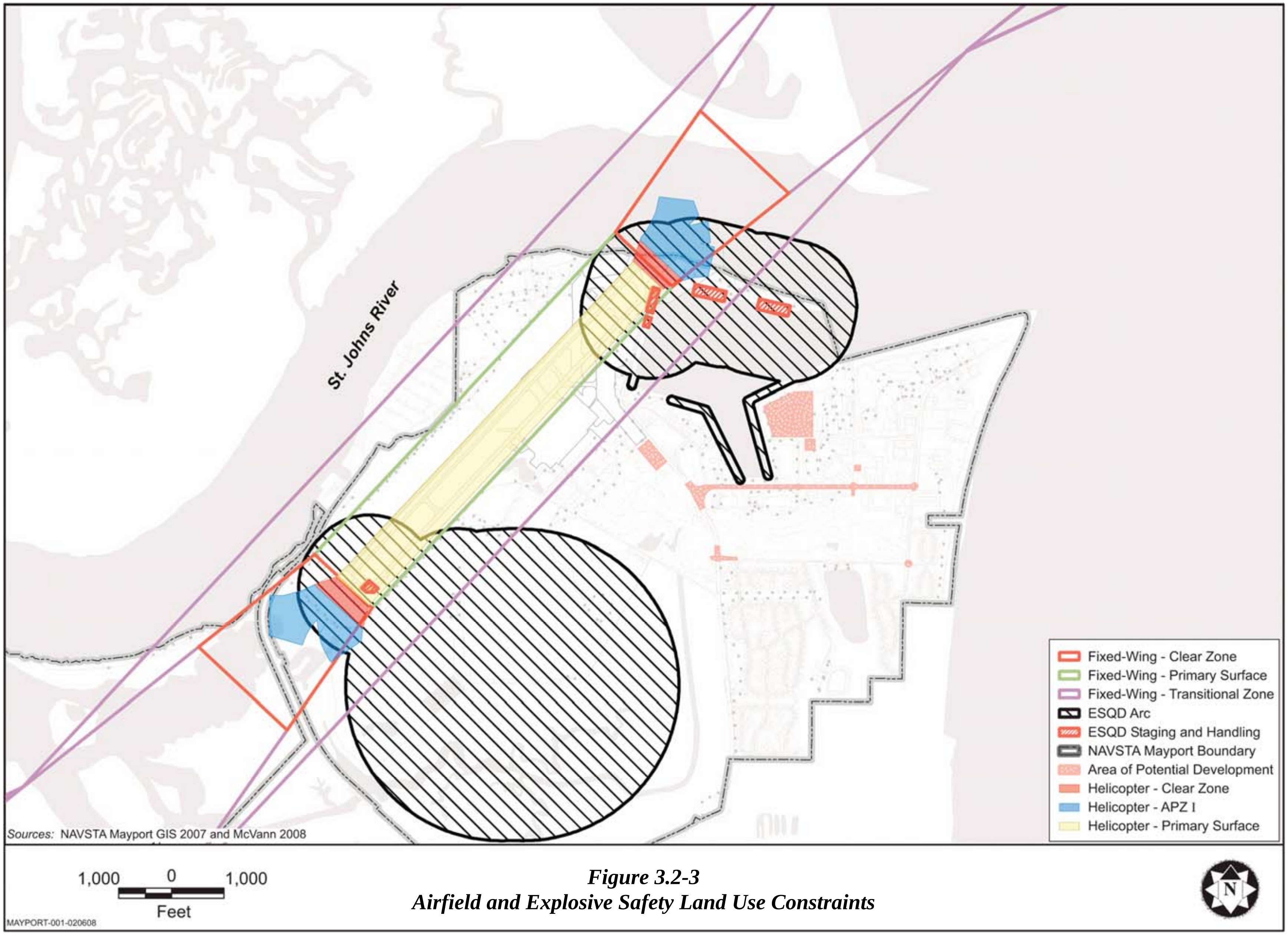


Figure 3.2-3
Airfield and Explosive Safety Land Use Constraints

The Fixed-Wing Primary Surface is the area on the ground centered lengthwise on the runway and extending 200 ft beyond the end of the runway. The Fixed-Wing Primary Surface is 1,500 ft wide for the NAVSTA Mayport runway. The Helicopter Primary Surface includes the areas where helicopters take off and land, plus 75 ft at each end (DoN 2003 and Departments of the Air Force, the Army, and the Navy 1981).

The Clear Zone Surface is the area adjacent to the runway end. The Fixed-Wing Clear Zones for the NAVSTA Mayport runway extend approximately 2,750 ft from both ends of the northeast-southwest-trending runway and are primarily located within the installation. The southwestern Fixed-Wing Clear Zone extends over State Route A1A. The Helicopter Clear Zones extend 400 ft from the runway ends and are within the installation boundary with the exception of the northwestern edge of the northeastern runway end where the Clear Zone extends over the St. Johns River. The Clear Zone must be cleared, graded, and free of aboveground objects (except airfield lighting) (DoN 2003 and Departments of the Air Force, the Army, and the Navy 1981).

The Fixed-Wing Transitional Surface is 1,500 ft each side of the entire length of the runway and connects with the approach-departure imaginary surface at the termination of the Fixed-Wing Clear Zone (see Figure 3.2-3). The Fixed-Wing Transitional Surface has a seven to one slope outward and upward from the runway centerline. This imaginary plane defines the maximum safe heights of buildings, towers, poles, and other possible obstructions to air navigation. Penetrations to the imaginary surfaces are not advised and new development should not be located beneath these surfaces if physically and economically feasible (DoN 2003 and Departments of the Air Force, the Army, and the Navy 1981).

3.2.3.2 Airfield APZs

Airfield APZs are established to identify areas of increased aircraft mishap potential. Within these zones, certain types of incompatible land development and/or activities are prohibited or restricted. The APZs at NAVSTA Mayport include Fixed-Wing and Helicopter Clear Zones and Helicopter APZ I (see Figure 3.2-3). The Clear Zones cover the same area as described in Section 3.2.3.1; however, in terms of APZs, Clear Zones encompass the area with the greatest potential for occurrence of aircraft accidents. Helicopter APZ I is an area of significant accident potential, but is less critical than the Clear Zone. Helicopter APZ I is established from the Helicopter Clear Zone end and follows standard approach-departure patterns. Virtually no type of development is considered compatible within APZ I (DoN 2002d). Areas within Helicopter APZ I are primarily water and/or marshlands. These areas are currently undeveloped, with the exception of on-Station development in the southern portion of the APZ I located at the northeast corner of the runway.

3.2.3.3 Explosive Safety Quantity Distance

The Secretary of Defense has established basic explosives safety standards and minimum ESQD criteria which are to be observed by DoD components in the performance of operations involving ammunition and explosives. ESQD standards require that ammunition and explosives being handled, stored, or under the supervision of the military services be maintained at certain minimum distances from inhabited buildings, passenger railroads, public highways, ships, and other facilities and property (DoN 1999). Areas encumbered by ESQD arcs are not considered to have high development potential. ESQD arcs at NAVSTA Mayport occur at two locations: the waterfront ordnance handling areas and the ordnance storage area as indicated on Figure 3.2-3. The ESQD arc associated with the ordnance storage area (and aircraft loading area) is located in the southwest portion of the station, well outside the area of potential development. The ESQD arcs associated with waterfront ordnance handling are located in areas that would be dredged and near areas of potential development. Berth C-1 is the primary weapons handling berth, but berths at C-2, B-2 (northern end only), and B-3 are also sometimes used to support ammunition loading and unloading. A 1,250-ft ESQD arc is in effect whenever ordnance handling operations are in effect at wharves C-1, C-2, and B-3. A smaller ESQD arc of 800 ft is in effect for the more limited ordnance handling activities that are authorized at the northern end of Wharf B-2 (NAVSTA Mayport 2006b). Non-essential personnel are restricted from within ESQD arcs when they are in effect.

3.2.3.4 Antiterrorism/Force Protection

AT/FP refers to the DoD-wide security program that was developed to protect service members, civilian employees, family members, facilities, and equipment from terrorist attacks. DoD Instruction 2000.16, DoD Anti-terrorism Standards, is the current policy directive; and Unified Facilities Criteria (UFC) 4-010-01, dated 8 October 2003 (DoD 2003), is the specific document recognized and represented as the DoD Minimum Antiterrorism Standards for Buildings. While specific DoD AT/FP guidance has evolved and is expected to continue to evolve with corresponding changes in threats and advances in effective protective measures, the basic objective of the guidance for inhabited buildings is expected to remain the same: to build greater resistance to terrorist attacks. The simplest and least costly method to achieve this outcome is to maximize standoff distance between a building and a possible threat. While sufficient standoff distances may not always be attainable, maximizing the available standoff distance will always result in the most cost-effective solution. Maximizing standoff distances also ensures that there is opportunity in the future to upgrade buildings to meet increased threats or to accommodate higher levels of protection. Important elements of AT/FP at NAVSTA Mayport relative to the proposed action are site security and standoff distances for new construction (or major investment in existing buildings). Vehicle and pedestrian entry to NAVSTA Mayport is secured by a controlled base perimeter and secured entry gates that are manned by the Provost Marshall Office and equipped to respond to security measures prescribed under various Terrorist Threat Conditions (THREATCONs). A port security barrier has been installed at the mouth of the turning basin and there is a restricted area that prohibits all persons, vessels, and craft, except those vessels operated by the U.S. Navy, visiting foreign navies, or the U.S. Coast Guard, from entering except in cases of extreme emergency (NOAA 2006). NAVSTA Mayport's approximately one mile-long beach is closed to the general public and is patrolled by the NAVSTA Mayport Security Department.

Within a controlled perimeter, the standoff distance required between facilities and parking spaces or roadways for conventional construction of new buildings is 33 ft for inhabited buildings and 82 ft for primary gathering buildings (i.e., inhabited buildings routinely occupied by 50 or more DoD personnel) (DoD 2003).

3.2.4 Natural Resource Management and Use

3.2.4.1 NAVSTA Mayport

Natural resource management and use at NAVSTA Mayport is prescribed in the Integrated Natural Resource Management Plan (INRMP) for NAVSTA Mayport (DoN 2007b). The Navy prepares INRMPs when it is determined that there are significant natural resources present on the installation. The goal of the NAVSTA INRMP is to implement an ecosystem-based conservation program that provides for conservation and rehabilitation of natural resources in a manner consistent with the military mission, integrates and coordinates all natural resources, provides for sustainable multipurpose use of natural resources, and provides public access for use of natural resources subject to safety and military security considerations. For the purposes of the INRMP, land use on NAVSTA Mayport is characterized as improved lands or grounds, semi-improved grounds, unimproved areas, and other lands. The majority of lands, 60 percent, are considered unimproved; 17 percent are categorized as improved; 12 percent semi-improved; and 11 percent other (DoN 2007b).

Outdoor natural resource-based recreation opportunities include water-based recreation associated with the Atlantic Ocean, St. Johns River, Intracoastal Waterway, Chicopit Bay, Lake Wonderwood, and local creeks. Helen Cooper Floyd Memorial Park lands were acquired by the Navy in 1976 to control development encroachment in the AICUZ footprint. NAVSTA Mayport entered into a lease with the City of Jacksonville that grants the city use of the property exclusively as a public park. The area is geographically isolated from fenced areas of NAVSTA Mayport and is accessible via an access road that intersects with State Route A1A and by water. Recreation opportunities are available to Navy personnel and the general public and include primarily fishing as well as bird watching and other passive recreational activities. Chicopit Point is leased to the City of Jacksonville for recreation purposes and also is used by the Mayport Marine Science Center for educational purposes.

Outdoor recreation access on-Station is available to active duty military personnel assigned to NAVSTA Mayport, their dependents and accompanied guests, Federal civilian employees assigned to NAVSTA Mayport, and military retirees. During certain security conditions, NAVSTA Mayport may be off-limits to recreation. Dispersed outdoor recreational opportunities available on-Station are shown in Figure 3.2-4 and include:

- Saltwater fishing at the South Jetty (Pelican Point), Chicopit Bay/Sherman Point, and along the beach;
- Wonderwood Lake (located in NAVSTA Mayport Family Housing area in the southeast portion of the installation) water recreation (freshwater fishing, canoeing, and kayaking); and
- Pedestrian/bicycle access to the South Jetty and beachfront at Pelican Point, nature trails at the NAVSTA Mayport front gate, service road west of the beach dunes, dune walkovers, along the beach, and paths at Helen Cooper Floyd Memorial Park.

Concentrated outdoor recreation opportunities (also shown in Figure 3.2-4) include picnic areas, a fitness/jogging trail, and skeet shooting facilities. The tidal wetlands south of Chicopit/Sherman Point in Chicopit Bay and west of State Route A1A are open to motorized boating and swimming, and swimming and surfing are allowed in the Atlantic Ocean (DoN 2007b).

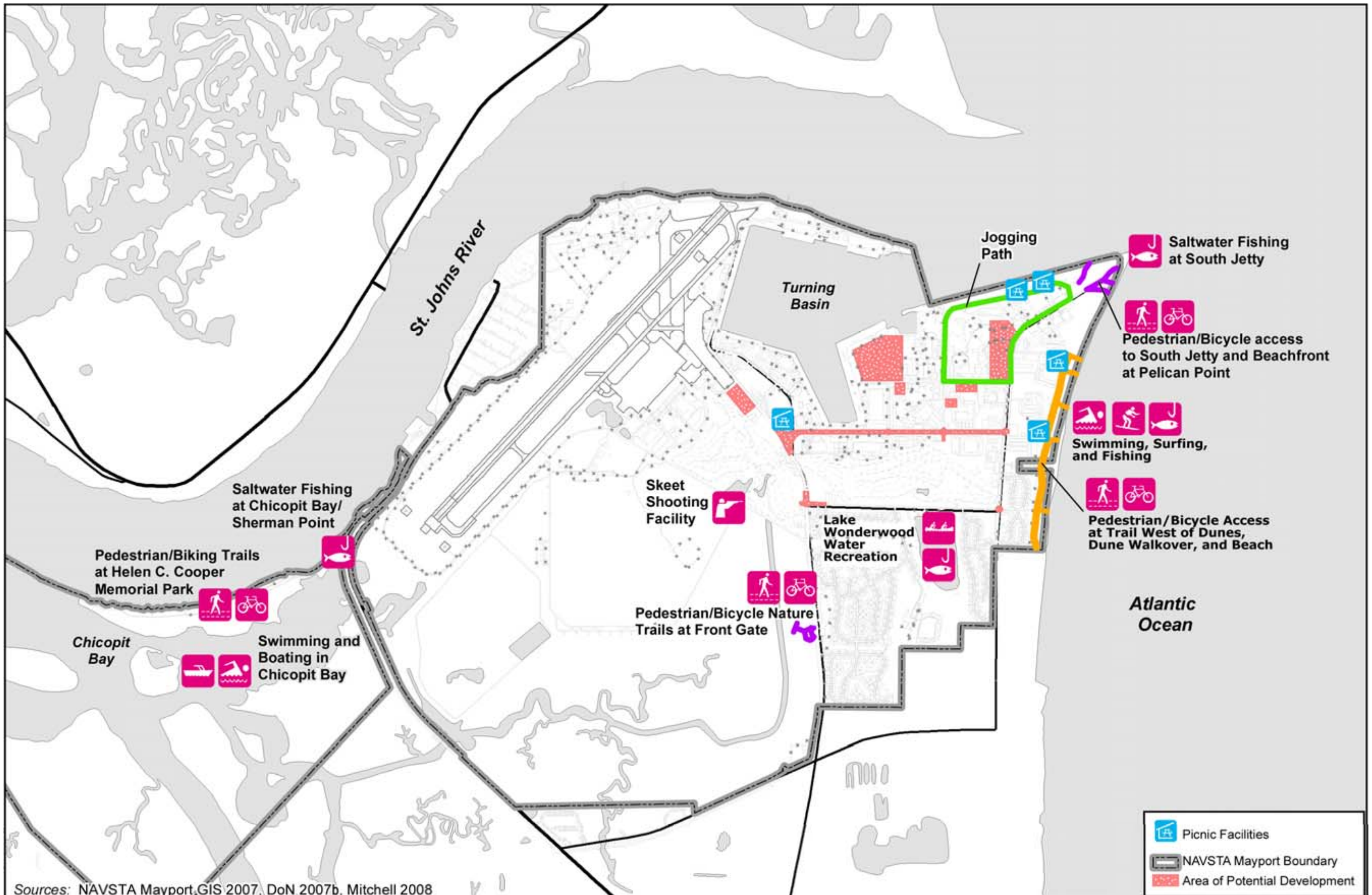


Figure 3.2-4
Outdoor Recreation Sites at NAVSTA Mayport

The INRMP establishes functional areas to focus management of natural resources that include two natural resource protected areas, one operational protected area, and one mixed-use management area. One natural resource protected area, located along the eastern edge of NAVSTA Mayport adjacent to the Atlantic Ocean, contains beach dune natural communities. The second natural resource protected area, located along the southern end of the southwestern section of NAVSTA Mayport, contains vast expanses of salt marsh and surface water bodies as well as the Chicopit Bay research area. This southern natural resource protected area is considered part of the Timucuan Ecological and Historic Preserve. The operational protected area is located in the center of the installation and includes the turning basin, airfield, dredged material disposal sites, and operations and community support areas.

Land management is the focus of the operational protected area due to the limited extent of natural resources, high military mission requirements, and high concentrations of human activity within this area. The area of potential development is within the operational protected area. The mixed use area is in the southwestern portion of NAVSTA Mayport where there is low intensity operational use, natural resource-based outdoor recreation benefits, and wildlife management opportunities. This area includes Lake Wonderwood and the golf course.

3.2.4.2 Parks, Beaches, and Conservation Areas in the NAVSTA Mayport Vicinity

Parks, beaches, and conservation areas in the NAVSTA Mayport vicinity, many of which have already been introduced, shape much of the land use in the vicinity of NAVSTA Mayport. Therefore, some additional details on these areas is provided herein. In 1999, the National Park Service, Florida Park Service, and City of Jacksonville signed a Memorandum of Agreement establishing the Timucuan Trails State and National Parks Partnership, mutually agreeing to commit staff, equipment, and facilities for the common protection of all resources contained in approximately 84,000 acres within Jacksonville's city limits (Timucuan Trail State and National Parks 2006). In the vicinity of NAVSTA Mayport, this includes:

- National Park Service: Timucuan Ecological and Historic Preserve, Fort Caroline National Memorial, Kingsley Plantation, and the Theodore Roosevelt Area. The Timucuan Ecological and Historic Preserve, created by Public Law 100-249 in 1988, is 46,000 acres of salt marsh grasses and waterways, wooded islands, and scenic vistas of the flat horizon. Approximately 75 percent of the Timucuan Ecological and Historic Preserve is comprised of wetlands and waterways that form an extensive estuarine system between the Nassau and St. Johns River. Less than 30 percent of the Timucuan Ecological and Historic Preserve is under National Park Service direct management; the remainder falls under the auspices of more than 300 different landowners. Recreational activities within the Timucuan Ecological and Historic Preserve include interpretive opportunities, trails, beaches, swimming, and fishing. Fort Caroline National Memorial is a 680-acre site that memorializes the French presence in Florida. The Kingsley Plantation located on 60 acres on Fort George Island bordering the Fort George River surrounds the oldest principal slave plantation structure still standing in Florida and also includes the remains of 23 slave cabins. The Theodore Roosevelt Area is 600 acres of woods, ponds, and wetlands adjacent to Fort Caroline National Memorial. Recreational opportunities in these areas range from dispersed hiking/nature trails to interpretive ranger programs and visitor centers.

- Florida Park Service: Fort George Island Cultural State Park, Little Talbot Island State Park. Fort George Island Cultural State Park is 620 acres of maritime hammock, shell mount, and estuarine tidal marsh. It includes the Ribault Club, which was built in 1928 as part of a golf-club complex. Little Talbot Island State Park is 1,800 acres of wide, sand beach, heavily vegetated sand dunes, and undisturbed salt marshes and is one of the few remaining undeveloped barrier islands in Northeast Florida. Recreation activities in these areas include camping, boating, fishing, hiking/nature trails, bird watching, swimming, canoeing/kayaking, and bicycling.

- City of Jacksonville: Helen Cooper Floyd Memorial Park, Kathryn Abbey Hanna Park, Huguenot Memorial Park, and Nassau River-St. Johns River Marshes Aquatic Preserve. The city's Parks, Recreation, and Entertainment Department is responsible for administering and operating the recreation and park facilities of the city. Both Kathryn Abbey Hanna Park and Huguenot Memorial Park are considered regional parks, meaning that they are predominately used by the majority of the city's citizens and can be considered a site of regional importance. Helen Cooper Floyd Memorial Park is discussed above since it is located on NAVSTA Mayport. Kathryn Abbey Hanna City Park, located south of NAVSTA Mayport along the Atlantic Ocean, consists of 450 acres of beaches, dunes, freshwater lakes, and woodlands. Huguenot Memorial Park is a 450-acre linear horseshoe shaped peninsula surrounded by Fort George Inlet, St. Johns River, and the Atlantic Ocean. Recreational opportunities at both parks include camping, swimming, surfing, boating, hiking/nature trails, and wildlife viewing. Huguenot Park allows driving on the beach and is popular for wind surfing. Along with the Timucuan Ecological and Historic Preserve, the City of Jacksonville has established the Nassau River-St. Johns River Marshes Aquatic Preserve as a special management area adopted through the City of Jacksonville's Comprehensive Plan and, thereby, contributes to the coastal management of Duval County. The goals of the Special Management Area Program in Jacksonville are to protect habitat for fish and wildlife with an emphasis on listed species; protect native vegetative communities; protect and/or enhance ecological values and productivity, and archaeological and historic preservation; promote education and research; provide recreational opportunities; and promote alternative modes of transportation.

- Dutton Island Preserve, which is not part of the Timucuan Trail State and National Parks, includes salt marsh ecosystems along the east side of Intercoastal Waterway and includes opportunities for canoeing/kayaking, fishing, picnicking, and wildlife observation. The Preserve is jointly managed by the City of Jacksonville and City of Atlantic Beach. An expansion project has been planned near the entrance of the Dutton Island Preserve which will include new facilities and hiking trails (City of Jacksonville 2007e).

Urban parks in the detailed study area include Modesky Park south of Ribault Bay Village, Mayport/Ocean Street Boat Ramp, and Oak Harbor Boat Ramp. The Atlantic Ocean beaches south of NAVSTA Mayport support beach recreation including swimming, surfing, sunning, picnicking, shell hunting, nature viewing, walking, kite surfing, boating, surf fishing, etc. The beaches are accessible to the general public with controlled entry at Kathryn Abbey Hanna Park and at various beach access points interspersed with residences throughout Atlantic, Neptune, and Jacksonville beaches.

3.2.4.3 Commercial Fishing

A wide variety of fish species that dwell in soft-bottom, hard-bottom, and coastal pelagic (i.e., at or near the sea surface or in the water column) habitats are caught and landed off the coast of Mayport. Important commercial fisheries species from these groups include brown shrimp, white shrimp (soft bottom), snappers (reef fishes), and king mackerels (coastal pelagic). The commercial shrimp fishery in the lower St. Johns River Basin is based upon three species: white shrimp, brown shrimp, and pink shrimp. Year-to-year variations in rainfall control the extent of upstream migration of these species. The bulk of the shrimp harvest takes place in the Atlantic Ocean during the nine-month period from June through February. Bait shrimp used as live bait for gamefish are caught along the river (DoN 1997). Rock shrimp are harvested offshore in deep water.

Table 3.2-2 Mean Commercial Annual Landings For Duval, Nassau, and St. Johns Counties in Florida (1998-2005)

Species	Pounds of Landings			
	Duval County	**Nassau County**	**St. Johns County**	**Total**
Amberjacks	89,374	4,012	17,110	110,495
Cobia	15,498	1,958	2,462	19,917
Dolphin	17,771	429	4,452	22,652
Flounders	34,730	4,807	18,178	57,714
Groupers[1]	108,838	5,060	23,218	137,116
Kingfish (Whiting)	255,841	39,590	14,600	350,032
Mackerel, King	25,883	833	6,016	32,732
Mullet, Black	135,837	2,076	29,537	167,450
Porgies	10,119	348	1,821	12,288
Seatrout[2]	7,674	9	152	7,835
Shark	215,709	377	39,744	255,829
Sheepshead	18,755	829	10,052	29,636
Snapper[3]	149,585	1,664	43,067	194,316
Swordfish	60,029	237	40	60,307
Triggerfish	21,761	49	6,142	27,952
Tuna[4]	13,714	126	535	14,374
Crab, Blue (Hard)	489,059	88,167	493,697	1,070,924
Crab, Blue (Soft)	20,584	38	4,426	25,048
Lobster, Spiny	20,536	585	1,588	22,708
Oyster	16	0	32,567	32,583
Squid	7,746	1,484	769	9,999
Shrimp (total shrimp food)[5]	2,835,319	819,073	111,191	3,765,583

Source: Fish and Wildlife Research Institute (FWRI) 2007a

Notes: [1]Includes black grouper, gag grouper, Nassau grouper, red grouper, scamp grouper, snowy grouper, warsaw grouper, yellowedge grouper, yellowfin grouper, mixed grouper, and other grouper

[2] Includes sand seatrout, silver seatrout, spotted seatrout, and weakfish seatrout

[3] Includes gray snapper (mangrove), lane snapper, mutton snapper, red snapper, sil snapper, vermilion snapper, yellowtail snapper, mixed snapper, and other snapper

[4] Includes albacore tuna, bigeye tuna, blackfin tuna, bluefin tuna, skipjack tuna, yellowfin tuna, and mixed tuna

[5] Includes brown shrimp, pink shrimp, rock shrimp, royal red shrimp, white shrimp, and other shrimp

The NMFS and the Fish and Wildlife Research Institute collect landings data from monthly reports submitted by commercial harvesters and dealers. Landings represent the part of the fish catch that is brought ashore. Landings record catch in weight and by land location and do not include information on water depth or distance from shore. The commercial landings data provided in Table 3.2-2 focuses on the dominant species from landings in Nassau, Duval, and St. Johns counties. Of the dominant species, shrimp food (including brown shrimp and pink shrimp) comprises 61 percent of the total, followed by blue crab at 17 percent, as shown in Table 3.2-3. The top finfish landing is kingfish with 5.7 percent for Duval, Nassau, and St. Johns counties combined. As presented in Table 3.2-4, the combined average annual landings from 1998 through 2005 for the Duval, Nassau, and St. Johns counties totaled more than 6 million pounds, of which 76 percent was comprised of invertebrates, specifically shrimp and blue crab. Fishes contributing to the landings included black mullet, flounders, groupers, kingfish, snapper, and shark.

Table 3.2-3 Top Species in Commercial Landings Ranked by Average Pounds Landed Per Year in Duval, Nassau, and St. Johns Counties Combined

Species	Average (in pounds)	Percent 1998 to 2005
Shrimp (total shrimp food)	3,786,583	61.3
Blue Crab (hard)	1,070,924	17.4
Kingfish	350,032	5.7
Shark	255,829	4.2
Snapper	194,316	3.2
Black Mullet	167,450	2.7
Groupers	137,116	2.2
Amberjacks	110,495	1.8
Flounders	57,714	0.9
King Mackerel	32,732	0.5
Total	**6,142,191**	**100**

Source: FWRI 2007a

Table 3.2-4 Total Average Commercial Landings Ranked by Average Pounds Landed Per Year in Duval, Nassau, and St. Johns Counties from 1998 to 2005

Average Commercial Landings (in average pounds)					
Landings	**Duval County**	**Nassau County**	**St. Johns County**	**Counties Combined**	**Percent for Combined Counties**
Finfish	1,288,516	71,675	241,153	1,601,344	24
Invertebrates	3,444,202	1,107,672	646,864	5,198,738	76
Total	**4,732,718**	**1,179,347**	**888,017**	**6,800,082**	**100**

Source: FWRI 2007a

As shown in Table 3.2-5, in 2005, Mayport accounted for 4.7 million pounds of landings, valued at approximately $8.1 million. The commercial fishing landings for Mayport from 1994 to 2005 totaled over 50 million pounds with a monetary value of $92.6 million. On average, from 1994 to 2005, the commercial fisheries industry for Mayport landed 5 million pounds or approximately $8 million annually. Although 0.8 million pounds more fish were landed in 2004 than in 1994, the monetary value of the landings was $5.6 million less in 2004.

Table 3.2-5 Commercial Landings for Mayport, Florida from 1994 to 2005

Year	Weight of Fish Landed (millions of pounds)	Monetary Value ($ millions)
1994	6.4	$13.5
1995	4.3	$8.0
1997	3.9	$6.1
1998	3.5	$7.3
1999	3.9	$7.7
2000	4.5	$9.9
2001	4.0	$8.3
2002	4.5	$8.4
2003	4.0	$7.4
2004	7.2	$7.9
2005	4.7	$8.1
Total	**50.9**	**$92.6**

Source: NMFS 2007c

3.2.4.4 Sport Fishing

The USFWS and U.S. Census Bureau's 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation reported that 2.8 million residents and non-residents age 16 years or older sport fished in Florida, of which 68 percent were Florida residents. In Florida, anglers 16 years or older spent approximately $4.3 billion on fishing expenses in 2006. Totals include food, lodging, transportation, equipment rental, bait, and cooking fuel. Table 3.2-6 summarizes total recreation expenditures for fishing in Florida in 2006.

Table 3.2-6 Sport Fishing Expenditures in Florida For State Residents and Non-Residents 16 Years and Older

Expenditure	Cost
Trip-related	$2.0 billion
Equipment	$1.9 billion
Other	$393 million
Total	**$4.3 billion**

Source: USFWS and U.S. Census Bureau 2006

Based on interviews with local sport fisherman (Strate 2007, Sipler 2007, Waddill 2007, and St. Laurent 2007), the jetties and St. Johns River inlet are considered popular fishing locations due to the variety, size, and amount of fish caught. Top species that sport fisherman catch by the jetties are sheepshead, redfish, tarpon, cobia, and flounder. Popular offshore catches which may occur in the dredging project area are black drum, sharks, spawning redfish, and sheepshead. Popular offshore fish are grouper, snapper, seabass, amberjack, dolphin, king mackerel, and wahoo. Table 3.2-7 contains a representation of popular species, top seasons, and locations caught for northeast Florida.

Table 3.2-7 Popular Sport Fishing Species for Northeast Florida

Species	Seasons	Location
Bull Whiting	Spring, Summer, Fall	Surf
Cobia	Spring, Summer, Fall	Spring – inshore Fall – offshore
Flounder	Spring, Fall	Inlets, jetties, creeks
Jack Crevalle	Summer, Fall	Offshore
Pompano	Spring, Summer, Fall	Surf
Redfish	Spring, Fall	Inshore
Shark	Summer, Fall	Inshore, Offshore, Inlets, Jetties
Sheepshead	Winter, Spring	Jetties
Speckled Sea Trout	Fall, Winter and Spring	Inshore, Inland
Tarpon	Summer, Fall	Inshore, Inland
Weakfish	Spring, Winter	Inshore, Inland

Source: Sipler 2007; Strate 2007

Local annual sport fishing tournaments occur in Mayport, Florida from early spring to fall. Table 3.2-8 lists sport fishing tournaments organized by a local sports fishing club, the Jacksonville Offshore Sports Fishing Club (JOSFC), which originate from the Mayport Boat Ramp. Local tournaments are not restricted to the list provided below. In Jacksonville, tournaments mostly occur in the spring and summer months.

Table 3.2-8 Sport Fishing Tournaments at Mayport, Florida

Tournament	Month	Location
El Cheapo Sheepshead Tournament	February	Mayport Boat Ramp
The River Fishing Tournament	March	Mayport Boat Ramp
Non-Live Tournament	April	Mayport Boat Ramp
May Trolling Tournament	May	Mayport Boat Ramp
Unlimited Trolling Tournament	May	Mayport Boat Ramp
Junior Angler Tournament	June	Mayport Boat Ramp
Kingfish Tune-up Tournament	July	Mayport Boat Ramp
Powder Puff Tournament	August	Mayport Boat Ramp
Light Tackle Tournament	August	Mayport Boat Ramp
The Bottom Fishing Tournament	September	Mayport Boat Ramp

Source: JOSFC 2007

As shown in Figure 3.2-5, fishing hot spots often occur in association with artificial reef sites, which are created to promote marine life and to benefit commercial and sports fishing. Artificial reefs are made out of heavy, stable, durable and non-polluting material, including old boats and concrete placed on sand or mud and not on a live bottom where coral and gorgonian grows. The artificial reefs located offshore of

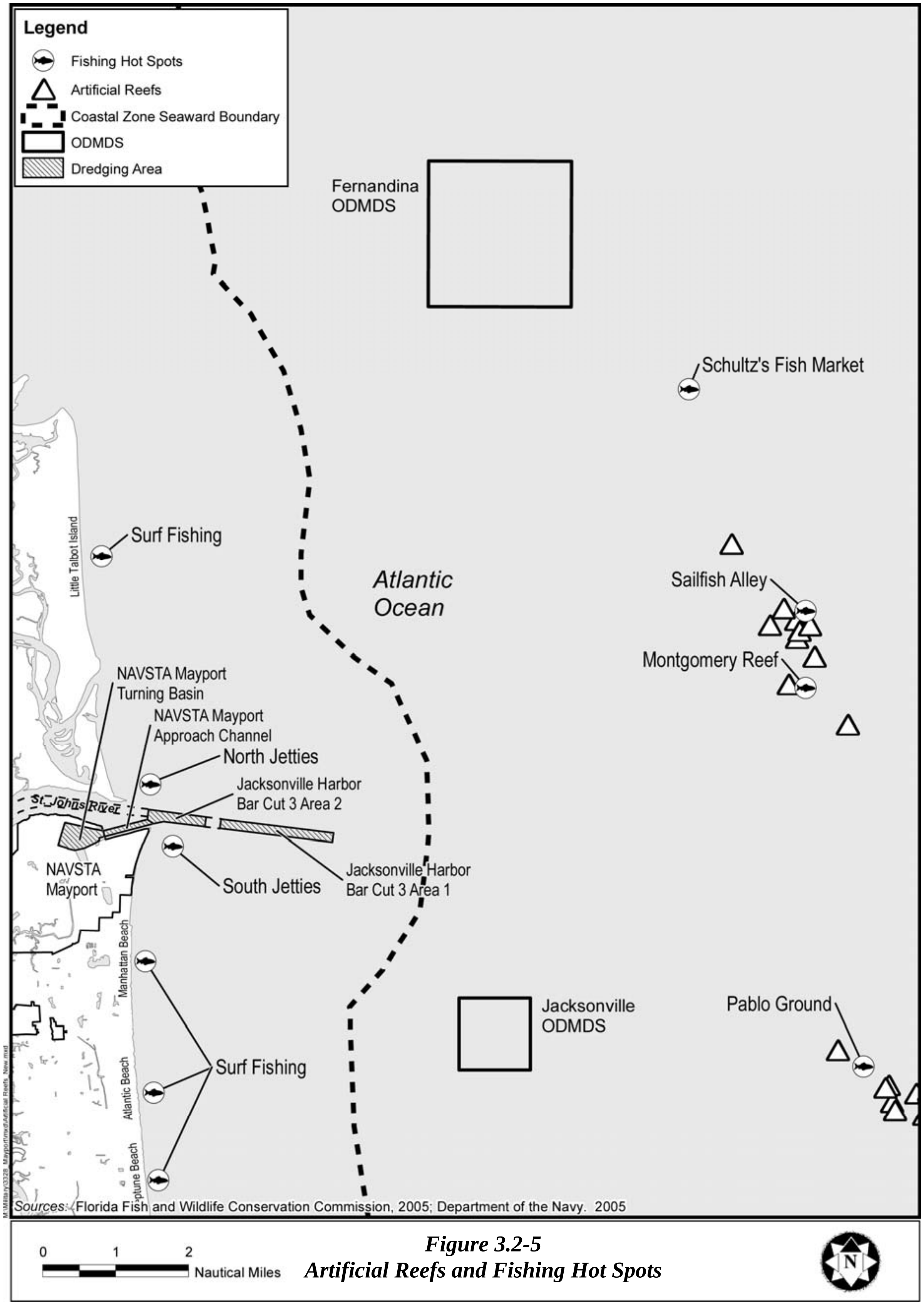


Figure 3.2-5
Artificial Reefs and Fishing Hot Spots

NAVSTA Mayport are not located within the federal navigation channel or in the immediate vicinity of the ODMDSs.

3.2.5 Coastal Zone

The coastal zone is rich in natural, commercial, recreational, ecological, industrial, and aesthetic resources. As such, it is protected by legislation for the effective management of its resources. The CZMA provides assistance to states, in cooperation with federal and local agencies, for developing land and water use programs in the coastal zone. This includes the protection of natural resources and the management of coastal development.

The CZMA establishes national policy to protect resources in the coastal zone. CZMA policy is implemented via NOAA-approved coastal management programs. Federal lands are excluded from the jurisdiction of such approved coastal management programs. The CZMA and its implementing regulations, however, provide that federal agencies must determine if it is reasonably foreseeable that their proposed actions, whether inside or outside of a state's coastal zone, will directly or indirectly affect any land or water use or natural resource within that coastal zone. The CZMA requires that federal activities affecting any coastal use or resource of a state must be consistent to the maximum extent practicable with the enforceable policies of the state's NOAA-approved coastal management plan. OPNAVINST 5090.1C Chapter 25 requires the Navy to review proposed actions to identify those actions affecting any land or water use or natural resource of the coastal zone. For all activities affecting the coastal zone, preparation of a Coastal Consistency Determination is required.

NOAA approved the Florida Coastal Management Program (FCMP), the state of Florida's federally approved management program, in 1981. Thereby, the State is empowered by the CZMA and its implementing regulations at 15 CFR 930 to review federal activities within or adjacent to its coastal zone to determine whether the activity complies with the requirements of the State's approved management program. The state has limited its federal consistency review of federally licensed and permitted activities to the federal licenses or permits specified in Section 380.23(3)(c) of the Florida Code requested for activities located in, or seaward of, one of the state's 35 coastal counties (FDEP 2007a). The coastal zone seaward boundary extends 3 nm from the shoreline (see Figure 3.2-5). The Florida State Clearinghouse, administered by the FDEP Office of Intergovernmental Programs, is the primary contact for receipt of consistency evaluations from federal agencies.

The FCMP consists of a network of 23 Florida statutes administered by eight state agencies and five water management districts. This framework allows the state to make integrated, balanced decisions that ensure the wise use and protection of the state's water, cultural, historic, and biological resources; protect public health; minimize the state's vulnerability to coastal hazards; ensure orderly, managed growth; protect the state's transportation system; and sustain a vital economy (FDEP 2007a). Of the 23 Florida statutes implemented by the FCMP, the following subject areas are most relevant to the proposed action and alternatives:

- Chapter 161, Beach and Shore Preservation;
- Chapter 252, Emergency Management;
- Chapter 253, State Lands;
- Chapter 258, State Parks and Preserves;
- Chapter 267, Historical Resources;
- Chapter 370, Saltwater Fisheries;
- Chapter 372, Wildlife;
- Chapter 373, Water Resources;
- Chapter 375, Outdoor Recreation and Conservation Lands;
- Chapter 376, Pollutant Discharge Prevention and Removal;
- Chapter 380, Land and Water Management;
- Chapter 403, Environmental Control; and
- Chapter 582, Soil and Water Conservation.

The remaining enforceable statues have little or no relevance to the proposed action and alternatives. The City of Jacksonville is a participating agency in the FCMP. In the Conservation/Coastal Element of the City's 2010 Comprehensive Plan, the city outlines 11 goals with supporting policies that direct the management and conservation of coastal resources and addresses air quality, water quality, native ecological communities, wetland conservation, unique or sensitive environments, sandy beaches and shorelines, coastal storm-related public safety and health, historical resources, level of service standards, siting and operation of boat facilities, and compatible development (City of Jacksonville 2004/2005).

3.3 WATER RESOURCES

The ROI for water resources includes the ground water supply at NAVSTA Mayport; surface waters in the area of proposed development at NAVSTA Mayport; where dredging and ODMDS disposal would potentially occur under the Group 2 and 3 alternatives; and wetlands and floodplains near the area of potential development. The detailed study area for surface waters includes the NAVSTA Mayport turning basin and entrance channel (see Figures 2.3-1 and 2.3-2), waters within and potentially affected by dredging in the Jacksonville Harbor Bar Cut 3 federal navigation channel (see Figure 2.3-3), and waters at and in the vicinity potentially affected by activities at Jacksonville and Fernandina ODMDSs.

3.3.1 Ground Water

Groundwater within the state of Florida is considered a vitally important natural resource and is extremely vulnerable to pollution. Consequently, groundwater is protected by a number of state and federal regulations. All of NAVSTA Mayport's potable water resources are obtained from supply wells located onsite that tap the Floridan aquifer. Groundwater quality from these supply wells is good. There are three aquifer systems at NAVSTA Mayport: the surficial, intermediate, and Floridan. Each of these is described below.

3.3.1.1 Surficial Aquifer System

The surficial aquifer system is a permeable hydrologic unit contiguous with the land surface and is comprised principally of unconsolidated (separated) siliciclastic sands and rock and carbonate sediments. The depth of the surficial aquifer at NAVSTA Mayport is approximately 100 ft below land surface. It contains the water table and the water within it is under mainly unconfined conditions. The lower limit of the surficial aquifer system coincides with the upper sandy-clay units of the Hawthorn Group.

Since the surficial aquifer is unconfined and is located relatively close to ground surface, it is recipient to any pollutant discharges that can penetrate the thin layer of highly permeable sediments that exist between the water table and ground surface. Additionally, leachable contaminants within contaminated soils can pass to the water table as a result of infiltration of rainwater. Recharge by local precipitation occurs at an estimated rate of 10 to 16 inches per year. The low permeabilities within the Hawthorn sediments form an effective confining unit and tend to limit vertical migration of contaminants. Moreover, the Hawthorn confining units act as an effective protective barrier that provides considerable protection for potable water supplies that are obtained from the Floridan aquifer.

Migration of surficial groundwater and mobile contaminants also occurs laterally. Throughout most of NAVSTA Mayport, groundwater flow in the surficial aquifer is generally toward the major surface water features that serve important ecosystem components. These water bodies include the Atlantic Ocean to the east, the St. Johns River to the north and northwest, intertidal *Spartina* marsh to the west, and Sherman Creek to the south (USEPA 2006b).

3.3.1.2 Intermediate Aquifer System

The intermediate aquifer system consists of sand and limestone layers interbedded in clayey sand and sandy clay of the Hawthorn Group and is situated between the surficial aquifer and the underlying Floridan aquifer system. These strata collectively retard the exchange of water between the overlying surficial aquifer system and the underlying Floridan aquifer system. The intermediate aquifer may be in hydraulic connection with the surficial aquifer. Recharge to the intermediate aquifer occurs primarily from precipitation in areas approximately 30 miles to the west of the NAVSTA Mayport site in Baker and Clay Counties where Hawthorn Group sediment occurs at shallow depths beneath the land surface (approximately 30 ft below land surface). Recharge may also occur in other areas where Hawthorn Group sediment outcrops (USEPA 2006b).

3.3.1.3 Floridan Aquifer System

The Floridan aquifer system is the principal source of freshwater in northeast Florida. It is composed of the Oldsmar and Avon Park Formations; the Ocala Limestone; and a few discontinuous thin water-bearing zones in the lower part of the Hawthorn Group. The Ocala Limestone is a homogeneous sequence of permeable, hydraulically connected marine limestone beds containing a few hard dolomite or limestone beds that restrict the vertical movement of water. The Avon Park Formation consists almost entirely of hard, relatively impermeable dolomite beds that restrict the vertical movement of water between the overlying and underlying permeable zones. The Oldsmar Formation contains alternating hard, relatively impermeable dolomite-confining beds and soft, permeable limestone and dolomite water-bearing zones. The top of the Floridan aquifer system occurs at a depth of about 400 ft below land surface at NAVSTA Mayport. Published transmissivities (the rate at which water is transmitted through a unit width of the aquifer) of the Floridan aquifer system in eastern Duval County range from approximately 85,000 to 160,000 gallons per day per ft.

Past research reports that groundwater in the Floridan aquifer system in the vicinity of NAVSTA Mayport is moving southward toward areas of heavy-pumpage along the coast. Floridan aquifer system wells in the vicinity of NAVSTA Mayport are under sufficient artesian pressure to flow at the surface. Water quality in the Floridan aquifer system is potable in the NAVSTA Mayport area. The concentration of total dissolved solids is approximately 400 mg/l and the concentration of chlorides is around 25 mg/l.

The potentiometric surface (an imaginary surface representing the static head of ground water and defined by the level to which water will rise in a tightly cased well) of the Floridan aquifer system exists at elevations above land surface, resulting in a net upward hydraulic gradient between the Floridan aquifer system and the surficial aquifer. This information suggests that the intermediate Hawthorn aquifer located in the Hawthorn Group potentially receives recharge from the Floridan aquifer system (USEPA 2006b).

3.3.2 Surface Waters

3.3.2.1 Regulatory Overview

Waters of the U.S. are protected under Section 404 of the Clean Water Act (CWA) of 1972. Waters of the U.S. are defined by the CWA as surface waters, rivers, lakes, estuaries, coastal waters, and wetlands. Waters of the U.S. generally include the following:

- All interstate waters;
- Intrastate waters used in interstate and/or foreign commerce;
- Tributaries of the above;
- Territorial seas at the cyclical high tide mark; and
- Wetlands adjacent to all the above (USEPA 2003a).

Section 404 of the CWA regulates the discharging of dredged or fill material into waters of the U.S. The USEPA and USACE jointly administer the Section 404 permit program. The USACE authorizes and issues the individual and general permits and has the responsibility of ensuring compliance with the permits. In addition, the USACE makes the determination if a particular plot of land is actually a wetland or water of the U.S. The USEPA jurisdiction lies with issuing guidelines and policies pertaining to Section 404 and determines if a portion of the program should be turned over to a state, territory, or tribe (USEPA 2003a).

The CWA requires that the surface waters of each state be classified according to designated uses. Florida has five surface water classifications (62-302.400 Florida Administrative Code [FAC]) with specific criteria applicable to each class of water: Class I - Potable Water Supplies; Class II - Shellfish

Propagation or Harvesting; Class III - Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife; Class IV - Agricultural Water Supplies; and Class V - Navigation, Utility, and Industrial Use (currently, there are not any designated Class V bodies of water) (FDEP 2007b). Under 62-302-400(10) FAC, a water body may be designated as an Outstanding Florida Water (OFW) in addition to being classified as Class I, Class II, or Class III. An OFW is a water designated worthy of special protection because of its natural attributes. This special designation is applied to certain waters, and is intended to protect existing good water quality (FDEP 2007c). OFWs are listed at 62-302.700 FAC.

Section 303(d) of the CWA addresses impaired waters, which are those waters that are not meeting their designated uses (e.g., drinking, fishing, swimming, shellfish harvesting, etc.). Based on Section 303(d) of the CWA and the Florida Watershed Restoration Act, Total Maximum Daily Loads (TMDLs) must be developed for all impaired waters. One water body may have several TMDLs, one for each pollutant that exceeds the water body's capacity to absorb it safely. Florida classifies the Lower St. Johns River as a Class III water body, with a designated use of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. The Lower St. Johns River was included on the 1998 303(d) list as impaired for nutrients. The river was verified as impaired by nutrients based on elevated chlorophyll-a levels (i.e., algal organic matter) in both the fresh and marine portions of the river, and was included on the verified list of impaired waters for the Lower St. Johns River Basin. The TMDLs establish the allowable loadings of total nitrogen (TN) and total phosphorous (TP) to the fresh and marine portions of Lower St. Johns River that would restore the river so that it meets its applicable water quality criteria for nutrients and dissolved oxygen (DO) (FDEP 2006).

The water body identification for the mouth of the St. Johns River is 2213A (includes the NAVSTA Mayport turning basin, entrance channel, beaches, and the federal navigation channel and continues upriver to where the St. Johns River meets the Atlantic Intracoastal Waterway) (USEPA 2008a). According to Chapter 62-304.415 FAC, the TMDL for the marine segments of the Lower St. Johns River, which is that portion of the river from Black Creek to the mouth, is 1,472,984 kilograms per year (kg/y) of TN, including 1,112,480 kg/y of TN for point sources and 360,504 kg/y of TN for non-point sources.

North and northwest of NAVSTA Mayport, the waters within the Timucuan Ecological and Historic Preserve and the Nassau River-St. Johns River Marshes Aquatic Preserve are designated as OFWs. The boundary of the OFW crosses the St. Johns River just upstream from the NAVSTA Mayport turning basin and continues across the river, following the shore of Huguenot Park (see Figures 1.1-1 and 1.1-2).

3.3.2.2 NAVSTA Mayport Turning Basin and Entrance Channel

Based on available data, the water quality in the NAVSTA Mayport turning basin and entrance channel meets FDEP Class III Marine Water Quality Standards (DoN 2000). Tides within the NAVSTA Mayport entrance channel are semi-diurnal (two highs and two lows per day). The mean and spring tidal ranges at the NAVSTA Mayport Turning Basin are 4.5 ft to 5.3 ft respectively. Average salinities in the basin range from 33 parts per thousand (ppt) during flood flow to 15 to 26 ppt during ebb flow, depending on tidal range and freshwater flow conditions (DoN 2000). Water quality measurements taken during March 2007 in the NAVSTA Mayport Turning Basin yielded a range of surface temperatures from 64.9 degrees Fahrenheit (ºF) to 68.2ºF and salinity readings from 29.4 ppt to 30.1 ppt. These are normal readings for this season and area.

Due to the close proximity of the Atlantic Ocean, the presence of semi-diurnal tides and other hydrodynamic influences, flushing within the turning basin and entrance channel is good. As part of an elutriate analysis, turning basin surface water samples were collected in March 2000 and analyzed for metals and semivolatile organic compound (SVOCs). No detectable concentrations of these substances were found in the samples, illustrating the relatively high quality of water and sediment in the NAVSTA Mayport turning basin (DoN 2000).

There is only limited information readily available of DO levels in the turning basin or entrance channel. Data collected in 1993 revealed no significant stratification from the surface to -40 ft depths. Despite the deep water depths and hot summertime conditions, the maximum DO change from top to bottom was 1.43 ppm (ppm is equivalent to mg/l) and minimum change was 0.20 ppm. No values were less than 4.0 ppm and a number of readings were above 5.0 ppm suggesting that good mixing is ongoing (DoN 2000). The Florida Class III DO criterion for predominantly fresh waters is a minimum DO of 5 mg/l (mg/l equates to ppm), and the criterion for predominantly marine zones is a minimum DO of 4 mg per liter, with a minimum daily average of 5 mg/l. However, FDEP and the St. Johns River Water Management District (SJRWMD) have established the following site specific alternative criteria for DO for the estuarine portions of the Lower St. Johns River: (1) a minimum DO concentration of 4.0 mg/l and (2) total fractional exposure to DO levels in the 4.0 to 5.0 mg/l range must also be at or below 1.0 for each annual evaluation period as determined an equation where the number of days within each interval is based on the daily average DO concentration (USEPA 2008a).

3.3.2.3 Federal Navigation Channel

The federal navigation channel occurs within the Lower St. Johns River, which is that portion of the St. Johns River that flows between the mouth of the Ocklawaha River, its largest tributary, and the Atlantic Ocean, encompassing a 2,750-square mile drainage area. Within this reach, the St. Johns River is 101 miles long and has a water surface area of approximately 115 square miles. The Lower St. Johns River is a darkwater river estuary, and along its length exhibits characteristics associated with riverine, lake, and estuarine aquatic environments (USEPA 2008a). The Lower St. Johns River is tidally influenced by the Atlantic Ocean; a brackish salt wedge, usually located near Green Cove Springs (approximately 20 miles south of downtown Jacksonville) characterizes the estuarine interface (SJRWMD 2006). The St. Johns River is the longest river in Florida, meandering more than 300 statute miles and is an unusual river in that it flows from south to north (NOAA 1999).

The source of the river (its headwaters) is a broad marsh area about 15 miles west of Vero Beach. The St. Johns River is considered a "lazy" river--the total elevation drop from its headwaters to the Atlantic Ocean is less than 30 ft, an average slope of about one inch per mile. The total flow in the river is comprised of about 80 to 90 percent tide-induced flow, with the remaining flow caused by wind, freshwater inflow (from tributaries and rain), and industrial and treatment plant discharges. The river flow generally increases downstream, with the highest flows occurring at the mouth of the river. The total discharge of the river is normally greater than 50,000 cubic ft per second (cfs) and can exceed 150,000 cfs. River flow is seasonal, and corresponds with the seasonal rain patterns, with higher flows occurring in the late summer to early fall, and the lower flows occurring in the winter months. The average annual nontidal discharge at the river mouth is approximately 15,000 cfs (NOAA 1999). Tides within the St. Johns River are semi-diurnal. The tidal flows are between 4.3 ft per second (fps) at the mouth of the river to 3.4 fps in Jacksonville (USACE 1996). The open ocean is a source of generally constant 36 ppt salinity. Salinity measurements in the 1994 survey of the federal channel near NAVSTA Mayport measured from 36.5 to 40.4 ppt (USACE 1994a).

As with the NAVSTA Mayport turning basin and entrance channel, water quality within the ROI of the federal channel is good and, based on available data, water quality meets FDEP Class II Marine Water Quality Standards. Like the NAVSTA Mayport turning basin and entrance channel, water quality is influenced by the close proximity of the Atlantic Ocean, semi-diurnal tides, and other hydrodynamic influences. Persistent, low concentrations of DO in the meso/polyhaline (saline at 5-30 ppt) reach of the Lower St. Johns River are well documented but poorly understood phenomena. The incidences of persistent, low DO conditions (below 5 mg/l) occur simultaneous with high summertime temperatures, and appear to be associated with the decline of significant algal blooms (FDEP and SJRWMD 2006). The State Class III water quality standard for DO levels in predominantly marine zones is less than 4 mg/l, with a minimum daily average of 5 mg/l. However, FDEP and SJRWMD have established the following site specific alternative criteria for DO for the estuarine portions of the Lower St. Johns River: (1) a minimum DO concentration of 4.0 mg/l and (2) total fractional exposure to DO levels in the 4.0 to 5.0 mg/l range must also be at or below 1.0 for each annual evaluation period as determined an equation where the number of days within each interval is based on the daily average DO concentration (USEPA 2008a).

3.3.2.4 Jacksonville and Fernandina ODMDSs

Past studies have examined water column chemistry at the Jacksonville ODMDS. While similar studies are pending the Fernandina ODMDS SMMP update, the water quality in these ocean sites is comparable. Water samples were collected at six of twelve sampling stations at the Jacksonville ODMDS during a 1998 survey in order to characterize water quality parameters of the disposal site (USEPA 1999b). Past surveys of dredged material disposal sites conducted by USEPA Region 4 show little or no changes spatially in the chemical constituents in the water column proximate to the other stations. To characterize the general water quality associated with the disposal site, the following water column parameters were sampled: DO, salinity, temperature, nitrogen series which include TP, nitrate-nitrite nitrogen (NO_2+NO_3), ammonia (NH_3), and total Kjeldahl nitrogen (TKN), light transmission, and chlorophyll a. Nutrients at all stations sampled in 1998 were all either below analytical detection limits or close to the analytical detection limit values. With the exception of DO, physicochemical parameters (measured by conductivity–temperature–depth profiles; temperature, salinity, oxygen and pH) were at normal levels and consistent between stations. DO results were low during 1998, ranging from 3-5 mg/l as opposed to approximately 6 mg/l in 1995 (USEPA 1999b).

3.3.3 Wetlands

Federal jurisdictional wetlands are considered Waters of the U.S. and are protected under Section 404 of the CWA of 1972. The 1977 CWA Amendments (33 CFR 328.3(b)) defines wetlands as:

"*... those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*"

Wetlands are the transitional areas between terrestrial habitats and aquatic habitats. In general, wetlands are distinguished from terrestrial habitats by the presence of water, either at the surface or within the root zone. Wetlands generally have anoxic (low oxygen) soil conditions which make them inhospitable to most terrestrial plants; however, there are plants, which are adapted to the anoxic conditions characteristic of wetlands.

In the vicinity of NAVSTA Mayport, water bodies include the Atlantic Ocean to the east, the St. Johns River to the north and northwest, intertidal *Spartina* (grass) marsh to the west, and Sherman Creek to the south. Within NAVSTA Mayport, surface water features include the turning basin in the north central portion of the base, an extensive area of tidal marsh and the Atlantic Intracoastal Waterway in the south and southwest portion, and Lake Wonderwood, which is a manmade lake created to provide fill for development.

In May 2004, wetland areas of the installation were mapped according to the criteria in the 1987 USACE manual for identifying and delineating jurisdictional wetlands. Approximately 1,950 acres of freshwater and tidal saltwater wetlands habitats were identified. Of this total, 1,720 acres are saltwater habitats and 230 acres are freshwater wetland habitats. These wetland areas are characterized as salt marshes, freshwater marshes, forested swamps, and tidal streams. The majority of wetlands at NAVSTA Mayport consist of salt marsh and tidal creeks (DoN 2004b). Figure 3.3-1 depicts the wetlands in the vicinity of the proposed alternative areas. The only wetland near the area of potential development is a drainage feature near the proposed transportation improvements at the Massey Avenue/Bon Homme Richard Street intersection. This drainage feature conveys water to the palustrine, forested, broad-leaved deciduous wetlands area 1ocated north of the golf course. Additionally, wetlands exist along the southern shore of the NAVSTA Mayport entrance channel, which would be dredged under the Group 2 and 3 alternatives. These wetlands are classified as emergent, estuarine, intertidal, persistent, and irregularly flooded (DoN 2004b).

3.3.4 Floodplains

Executive Order (EO) 11988, Floodplain Management, instructs federal agencies to consider the risks, danger, and potential impacts of locating projects within floodplains. The EO specifies that, in situations where alternatives are impractical, the agency must minimize potential harm to or within the floodplain and take appropriate steps to notify the public. Floodplains typically are described as areas likely to be inundated by a particular flood. For example, a flood that has a one percent chance of occurring in any one year is the 100-year flood. Due to the generally flat topography and low-lying land in the eastern

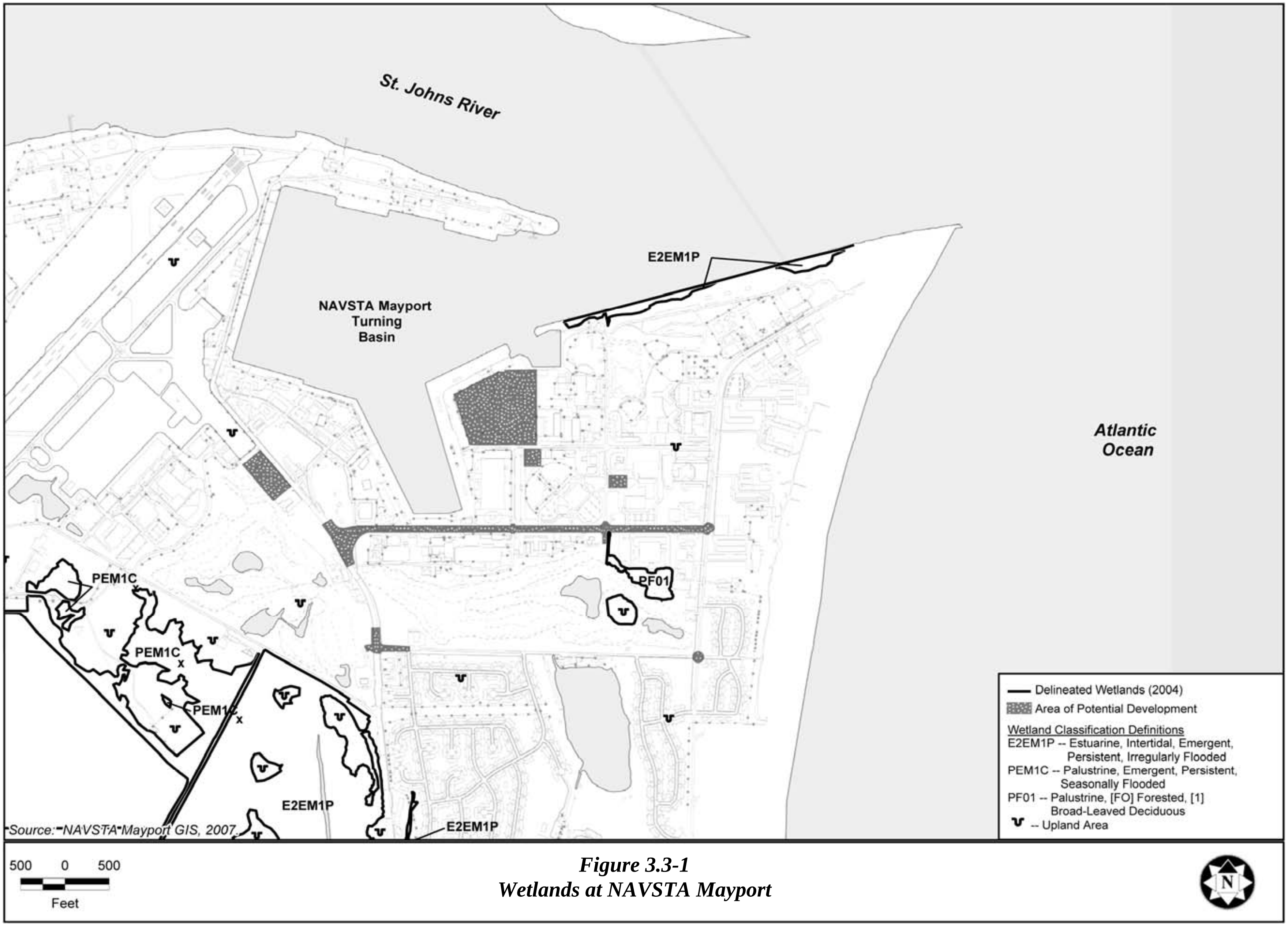


Figure 3.3-1
Wetlands at NAVSTA Mayport

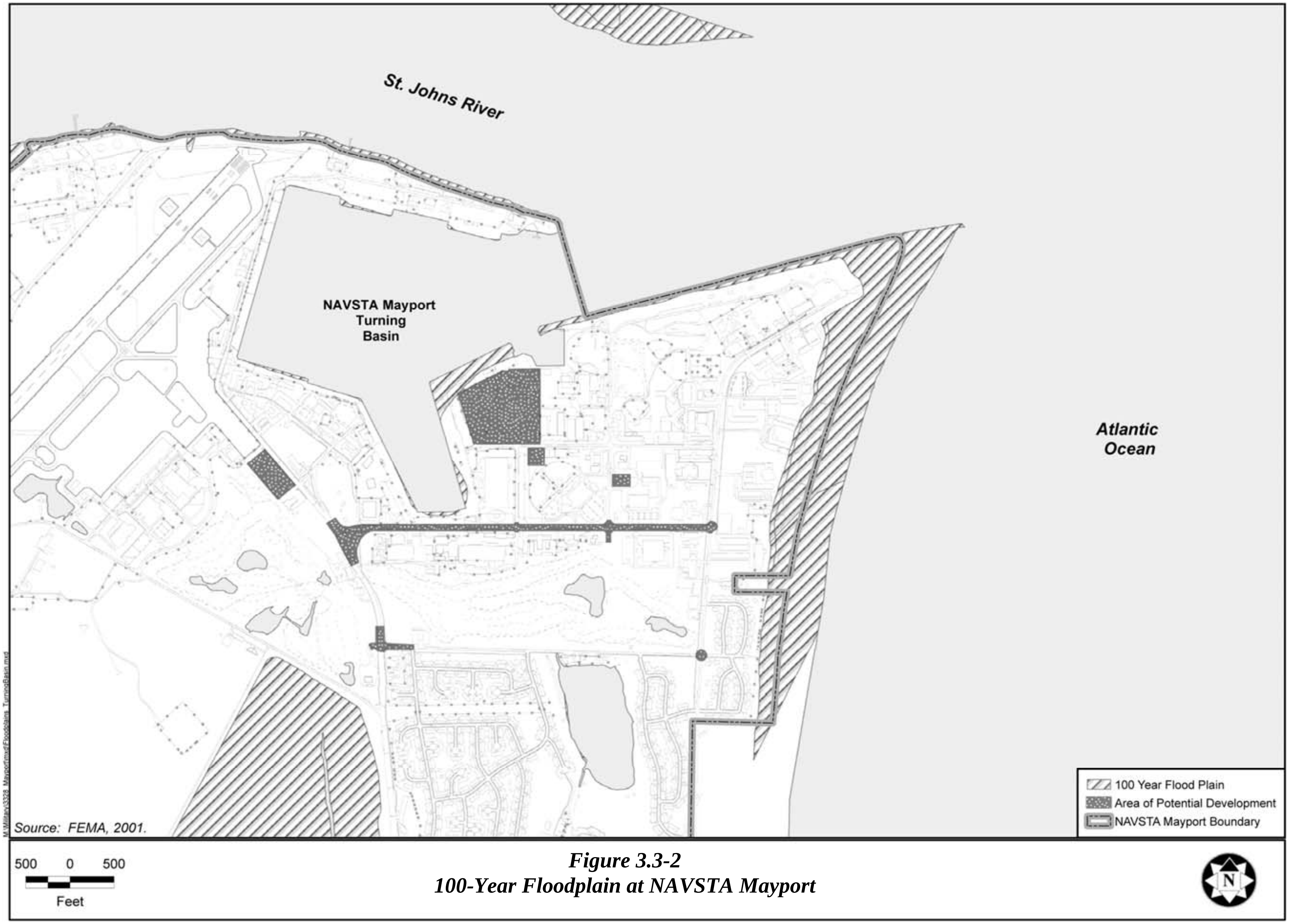


Figure 3.3-2
100-Year Floodplain at NAVSTA Mayport

portion of Duval County, floodplains and flood hazard areas are significant environmental factors affecting existing and future development in the region. Current Federal Emergency Management Agency (FEMA) maps indicate 100-year flood hazard elevations around NAVSTA Mayport to be between 6 and 14 ft above msl (Figure 3.3-2). On NAVSTA Mayport, low-lying areas adjacent to the St. Johns River and the Atlantic Ocean are subject to varying degrees of flooding (DoN 2002c). The 500-year flood elevation is 13.2 ft above msl (DoN 1997).

3.4 AIR QUALITY

The ROI for air quality is defined by the administrative/regulatory boundary of Duval County. Duval County is within the Jacksonville (Florida)-Brunswick (Georgia) Interstate Air Quality Control Region designated by USEPA. Understanding air quality for the affected area requires knowledge of:

- applicable regulatory requirements;
- types and sources of emissions (for stationary sources) and the horizontal and vertical extent of emissions from mobile sources such as ships;
- location and context of the affected area associated with the proposed action; and
- existing conditions (or affected environment).

Regulatory Requirements. Air quality in a given location is described by the concentration of various pollutants in the atmosphere. A region's air quality is influenced by many factors including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of the pollutant concentration is determined by comparing it to the federal and state ambient air quality standards. The Clean Air Act (CAA) and its subsequent amendments (CAAA) established the National Ambient Air Quality Standards (NAAQS) for seven "criteria" pollutants:

- ozone (O_3);
- carbon monoxide (CO);
- nitrogen dioxide (NO_2);
- sulfur dioxide (SO_2);
- particulate matter (PM) less than 10 microns (PM_{10});
- PM less than 2.5 microns ($PM_{2.5}$); and

- lead (Pb).

These standards represent the maximum allowable atmospheric concentrations that may occur while ensuring protection of public health and welfare, with a reasonable margin of safety. Short-term standards (1-, 8-, and 24-hour periods) are established for pollutants contributing to acute health effects, while long-term standards (quarterly and annual averages) are established for pollutants contributing to chronic health effects. The FDEP, Division of Air Resource Management (DARM) has adopted the NAAQS, with some exceptions and additions. In particular, the Florida sulfur dioxide standards are more stringent than the NAAQS. The state and national ambient air quality standards are presented in Table 3.4-1.

Table 3.4-1 Florida and National Ambient Air Quality Standards

Pollutant	Averaging Time	Florida Standard	National Primary NAAQS	National Secondary NAAQS
Carbon Monoxide	8-hour 1-hour	9 ppm[a] 35 ppm	9 ppm 35 ppm	NA NA
Lead	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$
Nitrogen Dioxide	Annual	100 $\mu g/m^3$ (0.05 ppm)	100 $\mu g/m^3$ (0.053 ppm)	100 $\mu g/m^3$ (0.053 ppm)
Ozone	8-hour[b]	--	0.075 ppm	0.075 ppm
PM_{10}	Annual	50 $\mu g/m^3$	50 $\mu g/m^3$	50 $\mu g/m^3$
$PM_{2.5}$	Annual 24-hour	-- --	15 $\mu g/m^3$ 35 $\mu g/m^3$	15 $\mu g/m^3$ 35 $\mu g/m^3$
Sulfur Dioxide	Annual[a] 24-hour[c] 3-hour[c]	60 $\mu g/m^3$ (0.02 ppm) 260 $\mu g/m^3$ (0.10 ppm) 1300 $\mu g/m^3$ (0.5 ppm)	0.030 ppm 0.14 ppm NA NA	0.5 ppm NA NA

[a] ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
[b] The new 8-hour ozone standard was changed on 12 March 2008
NA = Not applicable.
Source: USEPA 2008b

A locality's air quality status and the stringency of air pollution standards and regulations depend on whether monitored pollutant concentrations attain the levels defined in the NAAQS. Ambient air quality concentrations are expressed in parts per million or micrograms per cubic meter, but the standard used for describing existing and proposed air emissions is expressed in tons of pollutant per year. To ensure the NAAQS are achieved and/or maintained, the CAAA requires each state to develop a State Implementation Plan (SIP). According to the plans outlined in the SIP, designated state and local agencies implement regulations to control sources of criteria pollutants.

General Conformity. In addition, the CAAA provides that federal actions occurring in nonattainment and maintenance areas shall not hinder future attainment with the NAAQS and will conform with the applicable SIP (i.e., Florida's SIP). Duval County is considered by USEPA to be in attainment for all criteria pollutants, including ozone under the current 8-hour ozone standard. Because Duval County is in attainment with all criteria pollutants, the General Conformity rule does not apply, nor are there any requirements posed by FDEP for a conformity analysis of the proposed action. On 12 March 2008, USEPA changed the 8-hour ozone standard from 0.08 ppm to 0.075 ppm. Based on 2005-2007 data, Duval County's ozone compliance values are greater than 0.075 ppm. In order to implement the new standard, Florida's SIP will be modified to address reduction of ozone concentrations to levels in compliance with the standard. Florida has until 12 March 2009 to recommend to USEPA which areas of the state should be designated nonattainment for the new 8-hour ozone standard. The USEPA then has one year (by 12 March 2010) to make the final decision on nonattainment areas. This final decision will be based on the most recent data, and ozone levels could be reduced at that time from the 2005-2007 levels based on programs currently in place to reduce ozone levels (FDEP 2008).

The CAAA also establishes a national goal of preventing degradation or impairment in any federally designated Class I area. As part of the Prevention of Significant Deterioration (PSD) program, mandatory Class I status was assigned by Congress to all international parks, national wilderness areas, memorial parks greater than 5,000 acres and national parks greater than 6,000 acres. In Class I areas, visibility impairment is defined as a reduction in visual range and atmospheric discoloration. Stationary sources, such as industrial complexes, are typically an issue for visibility within a Class I PSD area.

There are three Class I areas designated in Florida: (1) Chassahowitzka Wilderness Area, (2) St. Marks Wilderness Area, and (3) Everglades National Park. The closest Class I area to NAVSTA Mayport is Chassahowitzka Wilderness Area, which is located on Florida's western coast near Crystal City, a distance of approximately 100 miles. This is well in excess of the 50 km (31 mile) limit typically used by Federal land managers to define a "near" Class I area and the types of visibility impacts analyses applicable to those areas (National Park Service, USFWS, and U.S. Forest Service 2000).

Types and Sources of Air Quality Pollutants. Pollutants considered in this EIS are SO_2 and other compounds (i.e., oxides of sulfur or SO_x); volatile organic compounds (VOCs), which are precursors to O_3; nitrogen oxides (NO_x), which are also precursors to O_3, and include NO_2 and other compounds; CO; PM_{10}; and $PM_{2.5}$. These criteria pollutants are generated by the types of activities (e.g., construction and mobile source operations) associated with the proposed action alternatives. Airborne emissions of lead are not included because there are no known significant lead emissions sources in the region or associated with the proposed action alternatives and the No Action Alternative.

3.4.1 Regional Air Quality

Jacksonville has a humid subtropical climate, with mild weather during winters and hot weather during summers. High temperatures average 64 to 91 °F (18-33 degrees Celsius [°C]) throughout the year. High heat indices are not uncommon for the summer months in the Jacksonville area. High temperatures can reach mid to high 90s with heat index ranges of 105 to 115 °F. Rainfall averages around 52 inches a year, with the wettest months being June through September. During winter, the area can experience hard freezes during the night. Such cold weather is usually short lived. Jacksonville has suffered less damage from hurricanes than other East Coast cities. The city has only received one direct hit from a hurricane since 1871, although Jacksonville has experienced hurricane or near-hurricane conditions more than a dozen times due to storms passing through the state from the Gulf of Mexico to the Atlantic Ocean (Climate-Zone 2006).

3.4.2 Affected Environment

The air quality affected environment for NAVSTA Mayport is Duval County, including the city of Jacksonville. As was mentioned earlier, Duval County is currently in attainment with all criteria pollutant standards. The DARM publishes the requisite Duval County Air Quality Maintenance Plan, the most recent of which was published in December 2002 and covers 2005-2015. This plan is under revision to update the current 8-hour ozone standard. This plan revision is expected to be submitted to USEPA Region 4 for review and approval (Rogers 2007). If approved, the revised plan will fall under Section 110 of the CAAA and will not entail any conformity obligations. Nassau County, which has always been categorized as attainment for all criteria pollutants, is included in the affected environment as it is the jurisdiction located closest to the Fernandina ODMDS.

Ground-based air emissions at NAVSTA Mayport are primarily generated from maintenance shops, aerospace ground equipment (AGE), boilers, and paint booths. NAVSTA Mayport maintains a CAA Title V permit with FDEP and maintains an annual inventory of stationary emission sources in accordance with this permit. As shown in Table 3.4-2, the total annual NO_x and VOC emissions (ozone precursors) at NAVSTA Mayport represent about 0.008 percent and 0.144 percent, respectively, of the 2001 emissions inventory for Duval County. Both VOCs and NO_x therefore represent significantly less than 1 percent of the total Duval County contribution. None of these pollutants represents a substantive attainment risk for the Duval County area.

Table 3.4-2 Baseline Emissions at NAVSTA Mayport Compared to Duval County (tons/year)

Source	CO	VOCs	NO_x	SO_x	PM_{10}	$PM_{2.5}$[1]
NAVSTA Mayport Total[2]	2.81	64.93	5.85	0.76	0.63	0.63
Duval County[3]	305,875	45,026	75,601	64,754	16,868	9,460
NAVSTA Mayport % Contribution	0.001	0.144	0.008	0.001	0.004	0.007

[1]*$PM_{2.5}$ was regulated by USEPA in 2005 and has not been adopted by the FDEP; therefore, it is not reflected in the NAVSTA Mayport inventory. For this reason, the inventory PM_{10} value is used for comparative purposes.*
[2]*NAVSTA Mayport 2006c.*
[3]*USEPA 2007*

3.5 NOISE

In this section, noise is discussed in terms of its effect on the human environment; discussion of and potential impacts to the natural environment (e.g., marine mammals) are evaluated in Sections 3.6 and 4.6, respectively. Noise is the term used to identify disagreeable, unwanted sound that interferes with normal activities or diminishes the quality of the environment (USACHPPM 2006). When sounds interfere with our speech, disturb our sleep, or interrupt routine tasks, they become noise. For purposes of this EIS, the ROI for noise encompasses the area that would be affected by noise generated from construction activities (including in-water noise from wharf improvements and dredging). Aircraft noise is not addressed because none of the alternatives for homeporting additional surface ships at NAVSTA Mayport would change aircraft operations at NAVSTA Mayport. Aircraft associated with an aircraft carrier joins the carrier once the carrier is out at sea.

3.5.1 Background

Within this EIS, noise is described by the sound intensity (or level) and measured in units called decibels (dB). The dB system of measuring sound provides a simplified relationship between the physical intensity of sound and its perceived loudness to the human ear. The dB scale is logarithmic; therefore, sound intensity increases or decreases exponentially with each dB of change. For example, 10-dB yields a sound level 10 times more intense than 1 dB, while a 20-dB level equates to 100 times more intense, and a 30-dB level is 1,000 times more intense.

The ambient (or surrounding) noise level of an area, like NAVSTA Mayport, includes sounds from both natural (wind, waves, birds) and artificial (aircraft, vehicle/ship engines, horns) sources. The strength/extent (or magnitude) and frequency of sound levels vary over the course of the day, throughout the week, and can be affected by weather conditions. The most common unit of frequency is the hertz (Hz), corresponding to one crest of a sound wave per second. For low-frequency sounds that can cause vibrations, a C-weighting metric is used; noted as dBC. Many find that these lower frequency sounds, like pile driving, are more annoying than other noises, so that is taken into account in this C-weighted metric. An A-weighted noise metric is used to reflect what people hear, noted as dBA. A-weighting is typically applied to measuring noise for activities such as construction engine equipment and aircraft take-offs and landings. Both metrics screen out very high and low sound frequencies that cannot be heard by humans.

Noise Perception. When hearing noise, reactions of people can be affected by a number of variables, including intensity (how loud the noise is), duration (does it last a second or an hour), repetition (does it occur every day or once a month), abruptness of the onset or stoppage of the noise (does it startle or come about at unpredictable times), background noise levels (does the noise occur in an urban or rural environment), interference with activities (does it interrupt phone conversations, listening to the radio, or television), previous community experience with the noise (some neighbors may have lived there for most of their lives, some may be new), time (does noise occur in the middle of the day or night), fear of personal danger from the noise sources (e.g., gunfire), and extent that people believe the noise can be controlled (USACHPPM 2006).

Noise impacts result from perceptible changes in the overall noise environment that increase annoyance or affect human health. Human health effects such as hearing loss and noise-related awakenings can result from noise. Annoyance is a subjective impression of noise wherein people apply both physical and emotional variables. To increase annoyance, the cumulative noise energy must increase measurably. Table 3.5-1 presents sound levels in dBs for typical sounds found in our environment and the reaction that might occur when a person (or receptor) is exposed to this noise.

Table 3.5-1 Common Sound Levels Measured in Decibels

Source (at a given distance)	Decibel (dB) Level	Typical Reaction
	140	Pain
Civil Defense Air Siren (100 ft)	130	
Jackhammer (50 ft)	120	Maximum Vocal Effort
Pile Driver (50 ft)	110	
Ambulance Siren (100 ft)	100	Very Annoying/ Discomfort
Motorcycle (25 ft) Power Lawnmower	90	
Garbage Disposal (3 ft) Alarm Clock	80	Intrusive
Vacuum Cleaner (3 ft)	70	
Normal Conversation (5 ft) Dishwasher	60	Normal Speech
Light Traffic (100 ft)	50	
Bird Calls (Distant)	40	Quiet
Soft whisper (5 ft)	30	
	20	Just Audible
	10	
Human Breathing	0	

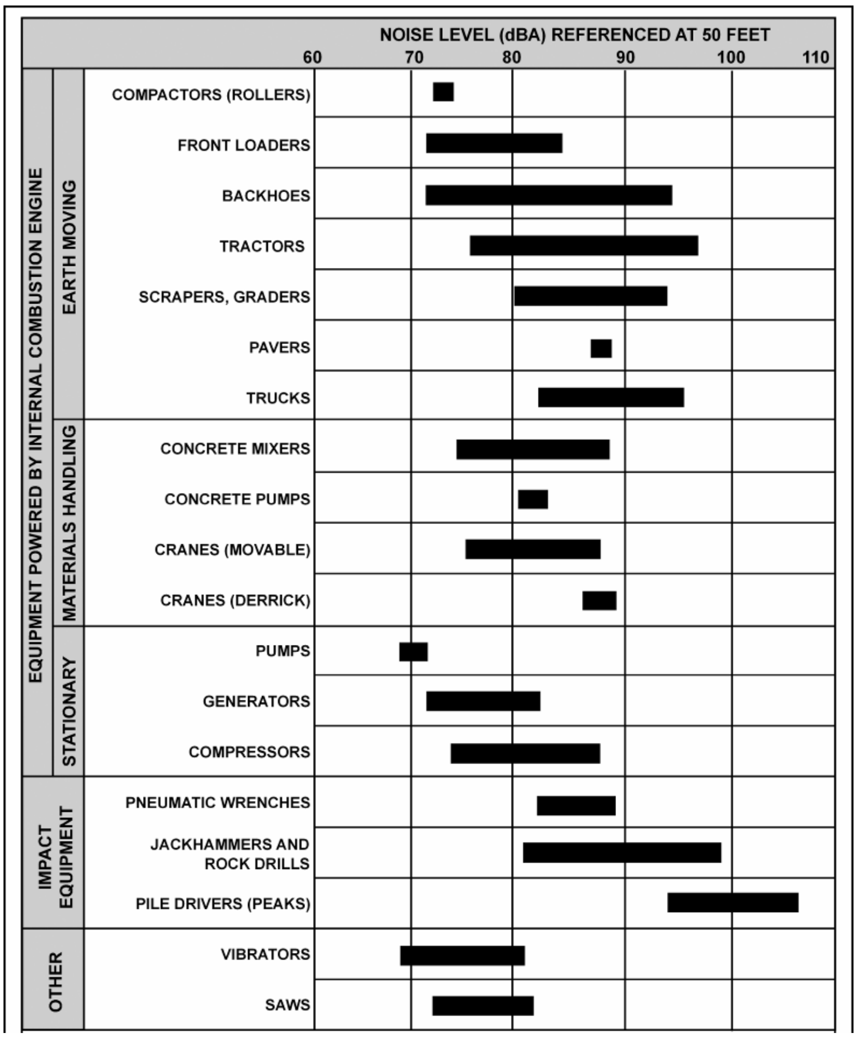
The most applicable federal guidelines for noise and vibration derive from the Federal Transit Administration (FTA). The FTA guidelines classify three categories of land use with special sensitivity to noise (FTA 2006). They are:

- Buildings or parks where quiet forms a basic element of their purpose;
- Residences and buildings where people normally sleep (e.g., homes, hotels, hospitals) where nighttime noise is most annoying; and
- Institutional land uses (e.g., schools, libraries, active parks, churches) with primarily daytime and evening use.

3.5.2 Construction Noise Transmitted Through Air

To characterize construction activity noise levels, this analysis uses USEPA data (USEPA 1971). Based on these USEPA criteria, construction noise resulting in an hourly equivalent sound level of 75 dBA at a sensitive receptor (e.g., hospital, residence, church) would represent a significant impact. Noise from construction activity varies with the types of equipment used and the duration of use (Figure 3.5-1). During operation, heavy equipment and other construction activities generate noise levels ranging typically from 70 to 90 dBA at a distance of 50 ft. Commonly, use of heavy equipment occurs sporadically throughout daytime hours.

Construction noise varies greatly depending on the construction process, type and condition of equipment used, and layout of the construction site. Overall, construction noise levels are governed primarily by the noisiest pieces of equipment (i.e., jackhammers, pile drivers). Table 3.5-2 shows the minimum distances at which noise from jackhammers and pile drivers could encroach on the indicated land use category. Based on this, areas that could be impacted by dBA noise levels would encompass commercial/industrial sites within 18 ft of the noise source and to residential areas within 177 ft of the noise source. Using these criteria, the affected environment for land-based construction noise is found completely within NAVSTA Mayport and encompasses the area within a 177-ft radius of the areas of potential development.



Note: Based on limited available data samples
Source: USEPA 1971

Figure 3.5-1 Common Construction Noise Levels

Table 3.5-2 Construction Equipment Noise Impact Distances (ft)

Equipment	Distance to Residential Land Use	Distance to Commercial or Industrial Land Use
Jackhammer	56	18
Pile Driver, Impact	177	56

In addition to construction equipment noise, vibrations are also a source of community annoyance. Vibration consists of a shaking of the ground that can cause buildings to shake and rumblings to be heard inside structures. Pile drivers produce vibrations that typically are transmitted through the ground. Many factors, such as the types of soils or rock underlying the equipment, influence the degree of vibration and the distance it travels. Vibration issues and annoyance tend to occur only with frequent (more than 70 per day) events at a location; infrequent events generally fail to result in perceptible levels. The distances at which annoyance from vibrations caused by common construction devices (CNSSTC 2002) occurs are presented in Table 3.5-3.

Table 3.5-3 Construction Equipment Vibration Impact Distances

Equipment	*Distance to Human Annoyance (ft)*
Pile Driver, Impact	Less than 525
Pile Driver, Vibratory	Less than 330
Vibratory Roller	Less than 265
Wheel Impactor	Less than 200
Large Bulldozer	Less than 85
Loaded Trucks	Less than 85
Caisson Drilling	Less than 85

The City of Jacksonville enforces a noise control ordinance, Rule 4, Noise Pollution Control (Jacksonville Environmental Protection Board 1995 and U.S. Department of Commerce 1965). Portions of the noise control ordinance applicable to facility construction in the project area are listed below:

- No construction equipment may be operated between 10:00 p.m. and 7:00 a.m., unless specifically permitted for a particular project by the City (Rule 4.208.A);
- No construction or maintenance equipment may be operated during daytime hours that emit a noise level that exceeds 65 dBA to residential areas and quiet recreation areas and sensitive receptors such as schools, retirement homes, medical facilities, churches, and undeveloped lands (Rule 4.208.C); and

- No construction equipment or maintenance equipment may be operated during nighttime hours that emit a noise level exceeding 60 dBA (Rule 4.208.D).

3.5.3 Underwater Noise

In addition to noise in the air, underwater noise can be produced by dredging, filling, pile driving, and other construction and/or upgrade activities. For underwater environments, ambient noise includes tides, currents, waves, as well as noise produced by marine mammals and by humans. Human-caused noise can be generated from operation of vessels, aircraft, dredging, and other activities. Low frequency noise levels such as these tend to carry long distances in the water but are attenuated the further away you are from the source. Maintenance dredging currently occurs periodically in the dredging project area, as often as every two years for the NAVSTA Mayport entrance channel and turning basin. Further up river deepening of the Jacksonville Harbor has involved some blasting upriver from the Jacksonville Harbor Bar Cut 3 federal navigation channel. Underwater noise as it relates to marine mammals is discussed in Sections 3.6 and 4.6. Measured sound exposure levels for equipment similar to the clamshell equipment that has been used in the past to dredge the NAVSTA Mayport turning basin range between 75 and 88 dBA measured at 50 ft (NMFS 2007d).

3.5.4 Sensitive Noise Receptors

Sensitive noise receptors identified both on- and off-Station are shown in Figure 3.5-2 in relation to the area of potential development and dredge area. Most off-Station sensitive noise receptors are located at least 1.5 miles from where facility construction and dredging would occur. There are two exceptions: (1) Finegan Elementary School, which is located south of NAVSTA Mayport approximately 0.75-mile south of the Moale Avenue/Maine Street intersection improvement project and (2) Huguenot Park, which is located approximately 0.75-mile north of the entrance channel dredge area. On NAVSTA Mayport, noise sensitive receptors include Pelican's Point Recreational Vehicle (RV) Park, Bachelor Quarters (including transient quarters), Medical and Dental Clinic, Chapel, Child Development Center, and NAVSTA Mayport Family Housing.

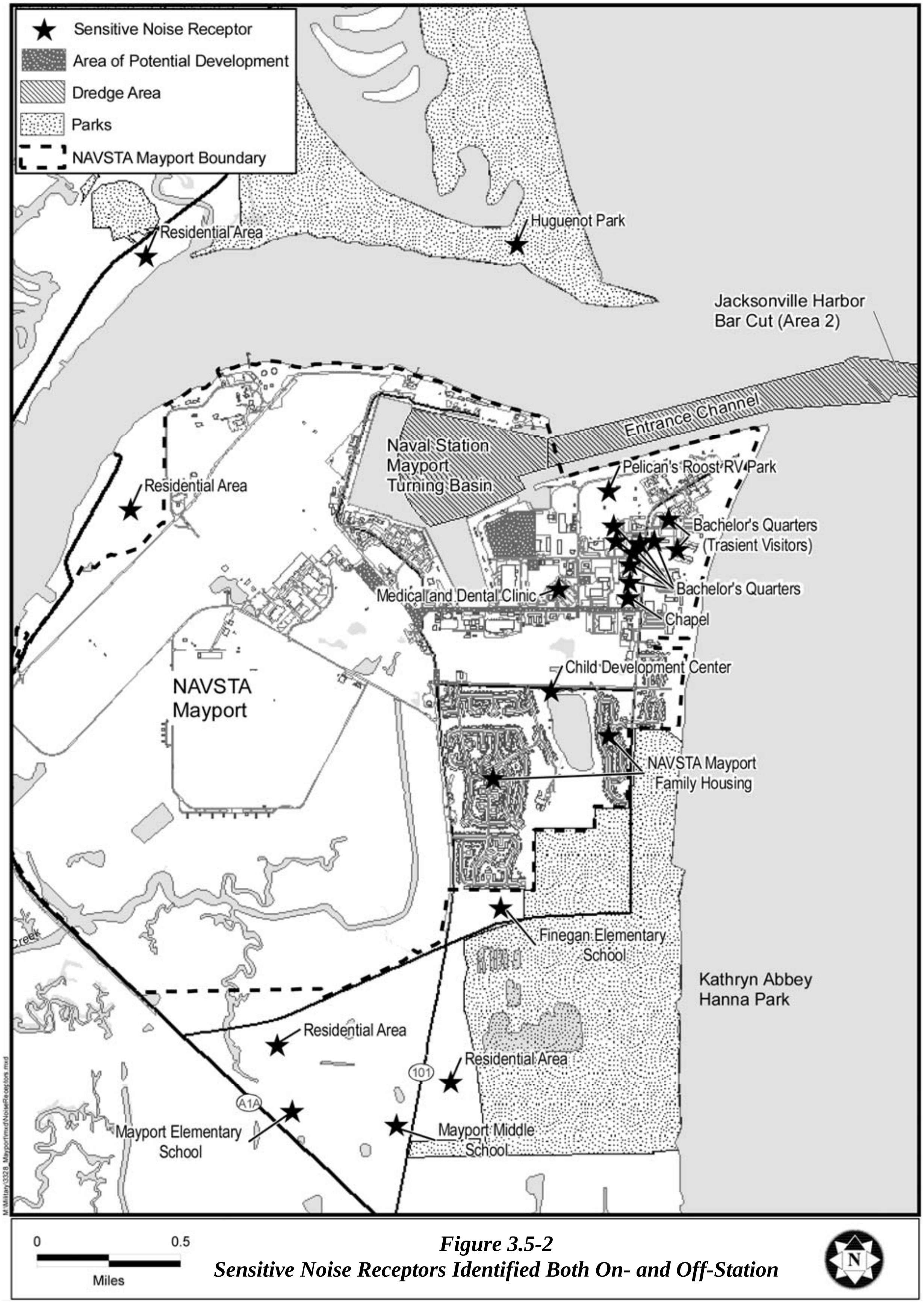


Figure 3.5-2
Sensitive Noise Receptors Identified Both On- and Off-Station

3.6 BIOLOGICAL RESOURCES

The ROI for biological resources includes marine and terrestrial areas. The marine ROI includes the NAVSTA Mayport turning basin and entrance channel, Jacksonville Harbor Bar Cut 3 federal navigation channel, Jacksonville and Fernandina ODMDSs, and the areas that vessels would transit between the dredge project area and the ODMDSs (see Figure 2.3-1).

The turning basin is connected to the federal navigation channel in the St. Johns River by a 500-ft wide entrance channel. The turning basin is maintained at a depth of -42 ft MLLW, with ship berths ranging in depth from -35 ft to -50 ft. The NAVSTA Mayport entrance channel and federal navigation channel also are maintained to a depth of -42 ft MLLW, but water depths within the federal channel naturally increase to greater than -55 ft MLLW further from shore. The 1 square nm Jacksonville ODMDS is located approximately 5.5 nm from the NAVSTA Mayport turning basin and 4.5 nm southeast of the mouth of the St. Johns River. It has an average depth of -46 ft MLLW and has been an active disposal site since 1952 (USEPA and USACE 2007). The 4 square nm Fernandina ODMDS is located approximately 8.5 nm northeast of the St. Johns River mouth. Depths within the Fernandina ODMDS range from approximately -40 ft to -67 ft MLLW and it has been an active disposal site since 1987 (USEPA and USACE 1998).

The terrestrial ROI includes the areas immediately adjacent to the turning basin and areas of proposed parking and transportation improvements where proposed construction or renovation of infrastructure and support facilities would occur.

Consultation with the USFWS and NMFS is required under section 7 of the Endangered Species Act (ESA) for all federal projects and other projects requiring federal permits (e.g., USACE permits) that could adversely affect any federally listed species and designated critical habitat. To support ESA consultation with the USFWS and NMFS, BAs have been prepared to assess the impacts of the Group 2 and 3 alternatives on ESA-listed species and designated critical habitat (see Appendix B.3). A Letter of Concurrence will be obtained from the USFWS and a Biological Opinion (BO) from NMFS prior to issuance of the Record of Decision of this EIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision. Appendix B.1 contains a list of all species of flora and fauna discussed and their corresponding scientific names. Appendix B.2 contains agency coordination letters. Appendix B.3 contains the BAs.

3.6.1 Marine Communities

3.6.1.1 Flora and Invertebrates

The following discussion of flora and invertebrates is based on limited survey data for the project-specific areas of the marine ROI.

Flora

Submerged Grasses. Seagrasses or submerged aquatic vegetation (SAV) are ecologically important habitat, functioning as a nursery and food source for recreational and managed fisheries as well as manatees and some sea turtles. SAV is regulated through state and federal laws including, but not limited to, Section 10 of the Rivers and Harbors Act, Section 404 of the CWA, and the Magnuson-Stevens Fishery Conservation and Management Act (Atlantic States Marine Fisheries Commission 1997; SAFMC 2007a). Maximum depths for SAV within the St. Johns River range from -5 ft to -6.5 ft MLLW (SJRWMD 1994).

Based on previous studies and seagrass habitat requirements, true seagrasses are probably not present in abundance in the marine sections of the Lower St. Johns River. Although widgeon grass has been reported in the St. Johns River, site specific abundance and distribution have not been studied within the ROI. Because wintertime temperatures are too low for turtle grass, summertime temperatures are too warm for eel grass, and suitable habitat for shoal grass does not exist, the Lower St. Johns River estuary within the vicinity of NAVSTA Mayport probably has no true seagrasses at high levels of abundance (SJRWMD 1994). However, designated Habitat Areas of Particular Concern (HAPCs), as described in Section 3.6.1.3, identify SAV habitat for relevant species. Otherwise, submerged grasses are not present in significant quantities within the ROI.

Brown Seaweed or Sargassum. *Sargassum* is free-floating seaweed found in mats along the offshore areas of the western North Atlantic. The mats are made up of two species of pelagic (open seas) brown algae. *Sargassum* is frequently seen in large quantities along the continental shelf off the southeastern U.S. More than 100 species of fish are associated with *Sargassum* habitat and it is considered essential fish habitat (EFH) for dolphinfish which feed primarily on *Sargassum*. Within the ROI, *Sargassum* would likely be present only in the vicinity of the ODMDSs (SAFMC 1998).

Phytoplankton. Phytoplankton is microscopic plant life that floats in the open ocean. Tidal influence and water exchange between the mouth of the St. Johns River and Atlantic Ocean support a diversity of phytoplankton populations. Salinity tolerance combined with limited photosynthetic capabilities is the main influence as to what species inhabit the area. Abundance of certain species fluctuates throughout the year. In the St. Johns River, dense blue-green algal blooms may occur in great abundance during summer months. Siliceous diatom (single-celled shell-covered marine organisms) species are the dominate phytoplankton in the St. Johns River and typically reach peak levels in February (SJRWMD 1994).

Phytoplankton populations at the ODMDSs consist primarily of diatoms, dinoflagellates (free swimming marine organisms), and coccolithophorids. The phytoplankton of the continental shelf waters are dominated by diatoms, with dinoflagellates abundant during the summer months. Presence of phytoplankton within the NAVSTA Mayport turning basin can be assumed to be similar to what occurs in the mouth of the St. Johns River and at the ODMDSs. There currently are no survey data available for plankton specifically present in the turning basin (DoN 1997).

<u>Invertebrates</u>

Zooplankton. Zooplanktons are small, mostly microscopic, animals such as crustaceans and fish larvae that inhibit the water column. Medium-sized zooplankton, large zooplankton, and ichthyoplankton (larval stages of fish species) are all represented in the St. Johns River and NAVSTA Mayport turning basin. Past studies conducted along the main stem of the St. Johns River and associated tributaries located within eight miles of NAVSTA Mayport showed medium and large zooplankton density and diversity greatest in spring and summer (DoN 1997). Calanoid copepods (microscopic marine crustaceans) are the most dominant medium-sized zooplankton species throughout the year. Crab larvae dominate the large zooplankton in summer, while mysid shrimp (shrimp-like organisms that carry their eggs in a pouch) are the most prevalent in spring and winter. Ichthyoplankton such as spotted sea trout and weakfish are more abundant in spring and summer months. Shrimp larvae exhibit greatest abundance on the inner-shelf during spring where they comprise up to 16 percent of total zooplankton mass present. Larval forage species are dominated by anchovy, while the other species include gobies (*Gobiosoma* spp. and *Microgobius* spp.) and blenny. Larval croaker are prominent in winter (DoN 1997).

Zooplankton populations at the ODMDSs are composed of copepods, chaetognaths (worm-like marine invertebrate), urochordates (small transparent organisms), jellyfish, pteropods (sea butterflies), decapods, and a variety of planktonic larvae. Calenoid copepods typically are the most abundant species. Zooplankton are most abundant in spring and autumn. Shrimp, crab, and fish larvae are abundant on the continental shelf and become fairly uncommon offshore (USEPA 1983).

Benthic Invertebrates. Benthic (living on the ocean floor) species inhabiting the lower St. Johns River and NAVSTA Mayport turning basin are typical of those found in a silty sand bottom environment. Species of mollusks, polychaetes, and echinoderms are abundant in spring, summer, and winter, but mostly absent in fall (DoN 1997).

The Jacksonville ODMDS benthic environment is composed primarily of sand. Benthic organisms from approximately 434 taxa occur at the site. Polychaetes, bivalves, gastropods, and malacostracans are represented with polychaetes being the most abundant and malacostracans the least (USEPA 1999a).

The Fernandina ODMDS benthic environment also is primarily composed of sand. Benthic organisms from approximately 255 taxa occur at the ODMDS. Polychaetes, bivalves, malacostracans, and gastropods are all represented at the site with polychaetes being the most abundant and gastropods the least (USEPA 2006a).

Shellfish. Oysters can be found in clumps along the intertidal areas of marshes and two species of hardshell clams can be found north of NAVSTA Mayport near the Fort George Inlet, Ft. George River, Simpson Creek, and Sisters Creek (DoN 1997). Shellfish are not common within either the Jacksonville or Fernandina ODMDSs (USEPA and USACE 2007; 1998).

Shrimp. Three panaeid shrimp species (white, brown, and pink) occur in the ROI. White shrimp begin spawning in April, typically 20 to 80 ft offshore; however, they occasionally spawn inshore or near inlets. Brown shrimp spawning takes place in winter at depths of approximately -45 ft. Pink shrimp spawn during the summer at anywhere from -12 to -50 ft. Large white shrimp migrate to commercial fishing areas from August through December, while brown and pink remain in estuaries during winter (SAFMC 1998). Spawning and migrating adult shrimp may be present in the vicinity in and around the ODMDSs.

3.6.1.2 Marine Fish

Approximately 170 species of coastal and estuarine fish have been identified for the entire St. Johns River (SJRWMD 1994). The most important finfish for recreational and commercial fisheries are whitings, spotted sea trout, weakfish, croaker, and red drum (SAFMC 1998). Refer to Section 3.2.4 for additional information on commercial and recreational fisheries.

Many species of fish inhabit the nearshore and offshore areas of the South Atlantic Ocean. Specific fisheries complexes are Snapper-Grouper, which include groupers, temperate basses, snappers, and tilefishes; coastal migratory pelagic species such as king and Spanish mackerel; and highly migratory species such as dolphinfish, swordfish, blue marlin, and many species of sharks (SAFMC 2007b).

3.6.1.3 Essential Fish Habitat (EFH) Assessment

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires federal agencies to consult with NMFS on activities that may adversely affect EFH. This EIS is prepared consistent with guidance provided by NMFS Southeast Regional Office to USACE, Jacksonville District regarding coordinating EFH consultation requirements with NEPA (NMFS 1999). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, or growth to maturity" (SAFMC 1998). Guidance published in 2002 states that "EFH must be identified and described for each life stage and for all species in the fishery management unit (FMU), as well as the physical, biological, and chemical characteristics of EFH, and, if known, how these characteristics influence the use of EFH by each species and life stage" (NMFS 2008b).

HAPCs are a subset of EFH. Fishery Management Councils (FMCs) are encouraged to designate HAPCs under the Magnuson Act. HAPCs are identified based on habitat level considerations rather than species life stages as are identified with EFH. EFH guidelines published in Federal regulations define HAPCs as types or areas of habitat within EFH that are identified based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat;
- The extent to which the habitat is sensitive to human-induced environmental degradation;
- Whether, and to what extent, development activities are or will be stressing the habitat type; and
- The rarity of the habitat type (50 CFR 600.815(a)(8)).

Based on these considerations, FMCs and NMFS have designated both 'areas' and 'habitat types' as HAPCs. In some cases, HAPCs identified by means of specific habitat type may overlap with the designation of a specific area. Designating HAPCs facilitates the consultation process by identifying ecologically important, sensitive, stressed, or rare habitats that should be given particular attention when considering potential nonfishing impacts. Their identification is the principal way in which the FMCs and NMFS can address these impacts (NMFS 2008c).

EFH and HAPCs within or in the vicinity of the ROI are managed by the Mid-Atlantic Fisheries Management Council (MAFMC), South Atlantic Fishery Management Council (SAFMC), and NMFS

(Table 3.6-1). The following section describes EFH and HAPCs for each species or FMU identified in Table 3.6-1. Only those species/FMU and specific EFH and HAPCs designations that occur within or in the vicinity of the ROI are described below and are listed in Table 3.6-1. Full EFH descriptions can be found in NMFS (2006b) and NMFS (2008a).

Table 3.6-1 Designated EFH, HAPCs, and Seasonal Occurrence within the ROI

Species	Life Stage[1]	Occurrence within ROI	HAPCs	Present within Vicinity of ROI
Species Managed by MAFMC				
Blue fish	J, A	St. Johns River/ Federal Navigation Channel	N	Year round
Summer flounder	L, J, A	St. Johns River/ Federal Navigation Channel	Y	Year round
Species Managed by SAFMC				
Red drum	J	St. Johns River/ Federal Navigation Channel	Y	June-August (St. Johns) Spring-Fall (Navigation Channel)
Coastal Migratory Pelagics	E, J, A	St. Johns River/Federal Navigation Channel, ODMDSs	N	Summer
Snapper-Grouper Complex	J	St. Johns River/ Federal Navigation Channel	Y	Summer
Panaeid Shrimp	J	St. Johns River/ Federal Navigation Channel	Y	Summer, winter
Highly Migratory Atlantic Species Managed by NMFS				
Sharks				
Atlantic sharpnose	N, J	Federal Navigation Channel	N	Year round
Blacknose	N, J	Federal Navigation Channel	N	Summer
Blacktip	N, J, A	Federal Navigation Channel	N	Seasonal migration occurrence
Bonnethead	N, J, A	Federal Navigation Channel	N	Year round
Bull	J	Federal Navigation Channel	N	Present-season unknown
Dusky	N, J, A	Federal Navigation Channel	N	Present-season unknown
Finetooth	N, J, A	Federal Navigation Channel	N	Present-season unknown
Lemon	N, J, A	Federal Navigation Channel	N	Summer (adults)
Nurse	J, A	Federal Navigation Channel	N	Rare occurrence
Sandbar	N, J, A	Federal Navigation Channel	Y	Year round
Sand tiger	N	Federal Navigation Channel	N	Rare occurrence
Scalloped	N, J	Federal Navigation Channel	N	Seasonal migration occurrence
Spinner	N, J	Federal Navigation Channel	N	Seasonal migration occurrence (rare)
Tiger	N, J, A	Federal Navigation Channel	N	Present-season unknown
Billfish				
Sailfish	J	ODMDSs	N	Year round

Notes: [1] *J – juvenile; A – adult; L – larval; E – egg; N – neonate/young-of-the-year.*

Sources: NMFS 2006b, 2008a.

Mid-Atlantic Managed Species

The MAFMC has designated EFH for bluefish and summer flounder within the ROI. Specific EFH for egg, larval, juvenile, and adult life stages are described in the sections below.

Bluefish. Bluefish are a migratory and pelagic species inhabiting most temperate coastal regions. Populations along the U.S. Atlantic Coast range from Maine to Florida with many wintering or spawning near the Mid-Atlantic Bight. Some populations head north from the Bight to winter while others migrate south to the Florida coast (NMFS 2006b). EFH is identified for major estuaries between Penobscot Bay, Maine and the St. Johns River, Florida for juvenile and adult forms of bluefish. Egg and larva1 forms of bluefish have designated EFH restricted to the pelagic waters over the continental shelf along Florida's coast with no inshore EFH designated. In general, juvenile bluefish occur in South Atlantic estuaries March through December and adults occur from May through January within the "mixing" and "seawater" zones (Shepherd and Packer 2006). Juvenile and/or adult bluefish may be present within the nearshore areas of the ROI at any time of the year.

Summer Flounder. Summer flounder generally occur in shallow coastal and estuarine waters during warmer months and occupy outer continental shelf areas in colder months. EFH identified for all life stages of summer flounder is primarily waters over the Continental Shelf (from the coast out to the limits of the 200-mile Exclusive Economic Zone), from Cape Hatteras, North Carolina to Cape Canaveral, Florida. All estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) are designated EFH for larvae, juveniles, and adults. Estuaries include those from Albemarie Sound to Broad River as well as the St. Johns and Indian rivers (Packer et al. 1999; NMFS 2008a). Larvae, juvenile, and adult summer flounder may be present within the ROI in spring/summer months and move through and out of the ROI during winter.

HAPCs are designated within juvenile and adult EFH to include all species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed as well as loose aggregations (NMFS 2008a). These HAPCs are more characteristic of those found further upstream into the St. Johns River and, therefore, HAPCs are not present within the ROI.

South Atlantic Managed Species

The SAFMC has designated EFH and HAPCs for red drum, Snapper-Grouper, coastal migratory pelagics, and shrimp (SAFMC 1998). Figure 3.6-1 depicts designated EFH and HAPCs in relation to the

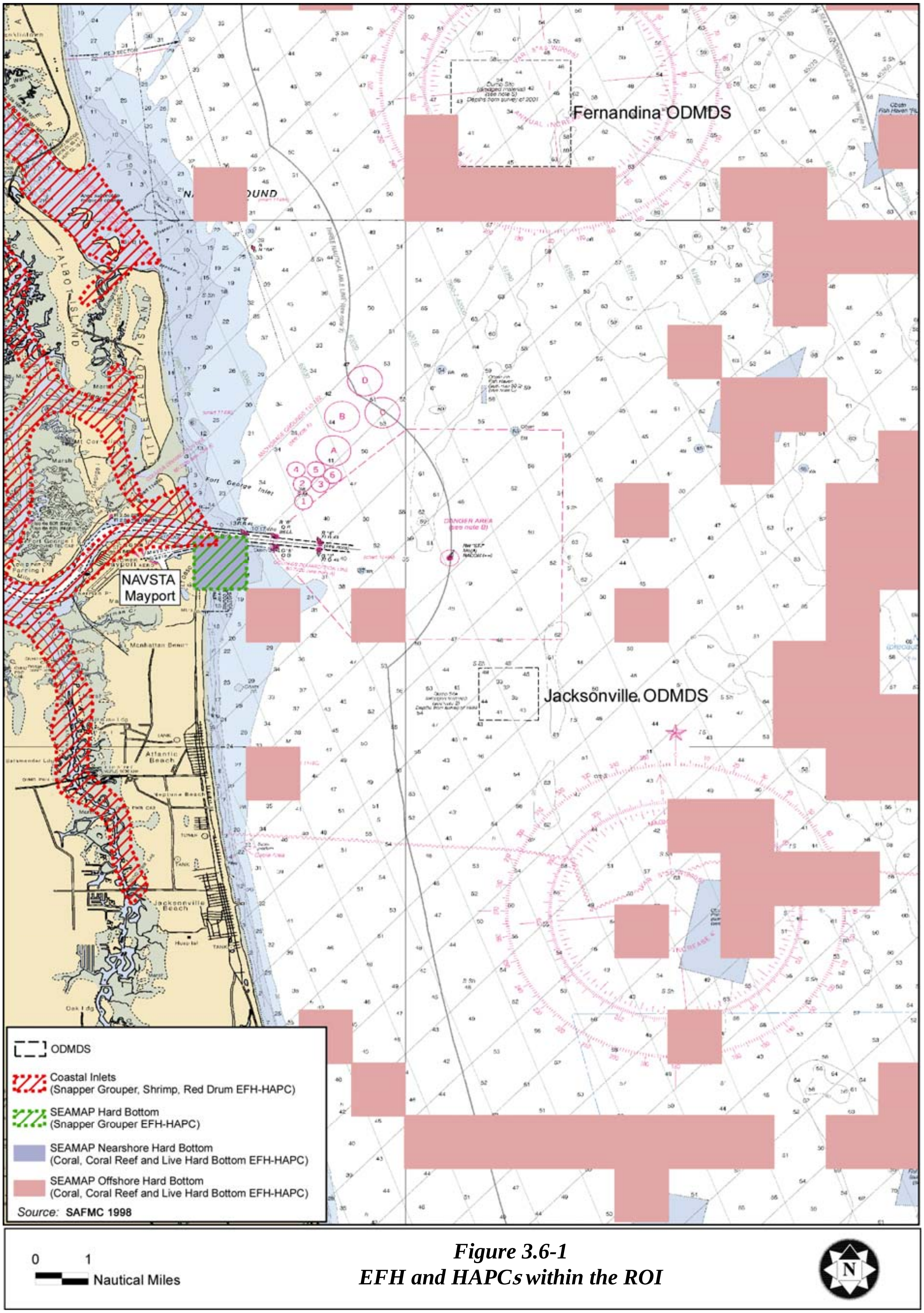


Figure 3.6-1
EFH and HAPCs within the ROI

NAVSTA Mayport turning basin, entrance channel, federal navigation channel, and ODMDSs (SAFMC 1998).

Red Drum. Red drum are distributed along the Atlantic coast inhabiting a variety of habitats between the Chesapeake Bay area through Florida. They spawn in the ocean along beaches, near inlets, and in high salinity estuaries. Juveniles are highly abundant during the high salinity months of June through August in the St. Johns River. Adults spend a majority of their time in the ocean upon maturation in estuaries and are fished both recreationally and commercially (SAFMC 1998).

EFH includes all the following habitats to a distance of 50 meters offshore: tidal freshwater, estuarine emergent vegetated wetlands (flooded saltmarshes, brackish marsh, and tidal creeks), estuarine scrub/shrub (mangrove fringe), submerged rooted vascular plants (sea grasses), oyster reefs and shell banks, unconsolidated bottom (soft sediments), ocean high salinity surf zones, and artificial reefs. The area covered includes Virginia through the Florida Keys. Red drum EFH within the ROI only occurs within the coastal inlet associated with the entrance channel and federal navigation channel (see Figure 3.6-1) (SAFMC 1998). Red drum are likely to be present in the ROI en route to spawning and nursery areas located further up the St. Johns River.

Areas which meet the criteria for HAPCs for red drum include all coastal inlets; all state-designated nursery habitats of particular importance to red drum; documented sites of spawning aggregations in Florida described in the Habitat Plan; other spawning areas identified in the future; and habitats identified for submerged aquatic vegetation. As with EFH, HAPCs for red drum within the ROI only occur within the coastal inlet associated with the NAVSTA Mayport entrance channel and federal navigation channel (see Figure 3.6-1) (SAFMC 1998). SAV, in particular, is very sparse in the areas currently dredged and red drum are likely to enter further up the St. Johns River to reach SAV habitat. Feeding and daily movements are common within channels and inlets that are typical dredging locations or heavy boat traffic areas. Adult red drum may be present in the dredge area during spring and fall; however, they generally tend to concentrate within inlets least trafficked (NMFS 2008a).

EFH and HAPCs for corals and live bottom habitat occur within the vicinity of the ROI, but none occur within the dredging or disposal areas (i.e., NAVSTA Mayport turning basin, entrance channel, federal navigation channel, and ODMDSs) (see Figure 3.6-1) (SAFMC 1998).

Snapper-Grouper Complex. The Snapper-Grouper complex contains 73 species from 10 families. Specific life history information for these species can be found in their fisheries management plans under jurisdiction of the SAFMC. In general, Snapper-Grouper species utilize both pelagic and benthic habitats. Larval stages are typically found in the water column while juvenile and adult stages occur closer to the sea floor. In addition, juvenile species of red grouper, yellowfin grouper, gray snapper, and mutton snapper are likely to occur in inshore seagrass beds, mangrove estuaries, lagoons, and bay systems and may be present in the St. Johns River at this early life stage. Man-made artificial reefs are also greatly utilized by Snapper-Grouper species. The commercial fishery for Snapper-Grouper typically occurs offshore in live bottom (-54.1 to -88.6 ft) and shelf-edge (-360.9 to -590.5 ft) habitats. EFH includes the spawning area in the water column above the adult habitat and the additional pelagic environment, including *Sargassum*, required for larval survival and growth up to and including settlement. The Gulf Stream is included as EFH due to its dispersal mechanism of Snapper-Grouper larvae. For specific life stages of estuarine dependent and nearshore Snapper-Grouper species, EFH includes areas inshore of the -100 ft contour, for macroalgae attachment; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs; and coral reefs and live/hard bottom on and around the shelf break zone from shore to at least 600 ft (but to at least 2,000 ft for wreckfish).

Areas that meet the criteria for EFH-HAPCs for species in the Snapper-Grouper complex include medium to high profile offshore hard bottoms where spawning normally occurs; localities of known or likely periodic spawning aggregations; mangrove habitat; seagrass habitat; oyster/shell habitat; all coastal inlets; all state-designated nursery habitats of particular importance to Snapper-Grouper; pelagic and benthic *Sargassum*; all hermatypic coral habitats and reefs; manganese outcroppings on the Blake Plateau; and Council-designated Artificial Reef Special Management Zones. Within the ROI, EFH and HAPCs occur within the coastal inlet associated with the entrance channel and federal navigation channel (see Figure 3.6-1) (SAFMC 1998). During the summer months, juveniles may be present in the ROI en route up the St. Johns River to seagrass beds and other preferred habitat described above. *Sargassum* is likely to be present near the ODMDSs and, therefore, Snapper-Grouper species may be present.

Coastal Migratory Pelagics. Coastal migratory pelagic fish occurring in the South Atlantic region include species such as king and Spanish mackerel, cero mackerel, cobia, and little tunny. They can be found in coastal waters out to the edge of the continental shelf. The larval habitat of these species is the water column and, within the spawning area, eggs and larvae are concentrated in the surface waters. The primary food source of coastal migratory pelagic species comes from nearby estuaries (SAFMC 1998).

In general, EFH for coastal migratory pelagic species includes all coastal inlets and all state-designated nursery habitats of particular importance to coastal migratory pelagics. Cobia EFH also includes high salinity bays, estuaries, and seagrass habitat. In addition, the Gulf Stream is EFH because it provides a mechanism to disperse coastal migratory pelagic larvae. For king and Spanish mackerel and cobia, EFH occurs in the South Atlantic and Mid-Atlantic Bights (SAFMC 1998).

Within the ROI, EFH occurs within the coastal inlet associated with the NAVSTA Mayport entrance channel and federal navigation channel. Cobia are common in St. Johns River during the high salinity months of June through August and all coastal migratory species discussed above may be present in the vicinity of the ODMDSs.

Penaeid Shrimp. As discussed in Section 3.2.4.3, panaeid shrimp (white, brown, and pink) are an important commercial fishery in the lower St. Johns River Basin. EFH for panaeid shrimp includes inshore estuarine nursery areas, offshore marine habitats used for spawning and growth to maturity, and all interconnecting water bodies as described in the *Habitat Plan* (SAFMC 1998). Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater, estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats. The area covered by this EFH is from North Carolina through the Florida Keys. Areas that meet the criteria for HAPCs for penaeid shrimp include all coastal inlets, all state-designated nursery habitats of particular importance to shrimp and state-identified overwintering areas.

Within the ROI, EFH and HAPCs occur within the coastal inlet associated with the NAVSTA Mayport entrance channel and federal navigation channel (see Figure 3.6-1) (SAFMC 1998). Spawning and migrating adult shrimp may be present within the vicinity of the ODMDSs. Juvenile pink and brown shrimp may be present at the coastal inlet during summer month migration out to deeper water after spending winters in the nursery areas (SAFMC 1998).

NMFS Managed Species: Highly Migratory Species (HMS) and Billfish

In general, EFH for HMS and billfish includes marine and estuarine water column habitats. More specific EFH descriptions for each species likely to be present within the vicinity of the ROI are broken down by life stage (neonate/young-of-the-year, juvenile, and adult). One billfish and 14 shark species have designated EFH within the vicinity of the ROI. Descriptions for each can be found below.

Billfish (Sailfish). Billfish include marlins (blue and white), sailfish, and spearfish that are federally managed under NOAA's HMS Fishery Management Plans. The only billfish with EFH within the vicinity of the ROI is sailfish. Sailfish range from 40° N to 40° S in the western Atlantic. They typically occur at or near the surface and occupy coastal to oceanic environments, but often occur in nearshore waters as well. Although sailfish typically move from the Florida Keys northward during the summer, there is a population that remains off the Florida coast year round. EFH is identified for the juvenile life stage of sailfish to include pelagic and coastal surface waters from 32° N south to Key West, Florida in waters from 5 miles offshore to 125 miles offshore, or the 200-mile Exclusive Economic Zone boundary, whichever is nearer to shore (NMFS 2006b). Juvenile EFH may be present within the vicinity of the ODMDSs. EFH identified for the adult, spawning, egg, and larvae life stages occurs outside the ROI.

Sharks

Atlantic Sharpnose Shark. The Atlantic sharpnose shark occurs in the waters of the northeast coast of North America. It is a common year-round resident along the coasts of South Carolina, Florida and the Gulf of Mexico, and is abundant in Virginia during summer months. EFH identified for the neonate life stage of Atlantic sharpnose shark includes shallow coastal areas, bays, and estuaries out to the 25-meter isobath (i.e., seabed contour) from Daytona Beach, Florida north to Cape Hatteras, North Carolina. For juveniles, EFH is identified in shallow coastal areas, bays, and estuaries out to the 25-meter isobath from Daytona Beach, Florida north to Cumberland Island, Georgia. EFH identified for adults is located south of the ROI (offshore areas of St. Augustine south to Cape Canaveral, Florida) (NMFS 2006b). All life stages may be present within the ROI.

Blacknose Shark. The blacknose shark is abundant in coastal waters from the Carolinas to Florida and Gulf of Mexico. EFH identified for the neonate life stage of blacknose shark includes shallow coastal waters to 25 meters from the North Carolina-South Carolina border south to Cape Canaveral, Florida. For juveniles, EFH is identified in shallow coastal waters to 25 meters from the Georgia-Florida border south to West Palm Beach, Florida. EFH identified for adults is located south of the ROI (shallow coastal waters of St. Augustine south to Cape Canaveral, Florida) (NMFS 2006b). Neonate and juvenile life stages of blacknose shark may be present in the ROI during summer months.

Blacktip Shark. Along the Southeastern U.S., the blacktip shark occurs from Virginia to Florida and in the Gulf of Mexico. They migrate seasonally north-south along the coast, often in schools. EFH identified for the neonate life stage of blacktip shark includes shallow coastal waters from Bull's Bay, South Carolina at 33.5° N, south to Cape Canaveral, Florida. For juveniles, EFH is identified in shallow coastal waters from the shoreline to the 25-meter isobath: from Cape Hatteras, North Carolina at 35.25°N to 29°N at Ponce de Leon Inlet. EFH identified for adults includes shallow coastal water areas north of

St. Augustine, Florida at 30°N to Cumberland Island, Georgia (NMFS 2006b). Adults may be present in the ROI during seasonal north-south migrations.

Bonnethead Shark. Bonnethead hammerhead sharks are typically found in shallow coastal waters with sandy/muddy bottoms. EFH identified for the neonate life stage of bonnethead shark includes shallow coastal waters, inlets, and estuaries less than 25 meters deep from Jekyll Island, Georgia to just north of Cape Canaveral, Florida. For juveniles, EFH is identified in shallow coastal waters, inlets, and estuaries from Cape Fear, North Carolina southward to West Palm Beach, Florida in waters less than 25 meters deep. EFH identified for adults includes shallow coastal waters, inlets, and estuaries from Cape Fear, North Carolina to Cape Canaveral, Florida (NMFS 2006b). All life stages of bonnethead sharks may be present in the ROI.

Bull Shark. The bull shark is a large, shallow water shark occurring in estuaries and often entering freshwater. Only the juvenile life stage of bull shark has EFH identified within the vicinity of the ROI. EFH includes shallow coastal waters, inlets, and estuaries in waters less than 25 meters deep from Savannah Beach, Georgia southward to the Dry Tortugas, Florida. EFH identified for neonate and adult life stages of bull shark occurs outside the ROI (NMFS 2006b). Bull sharks may be present in the ROI traveling to coastal nursery lagoons along the east coast of Florida.

Dusky Shark. The dusky shark is common in warm and temperate continental waters throughout the world, migrating seasonally north-south along the coast. EFH identified for the neonate life stage of dusky shark includes shallow coastal waters, inlets and estuaries to the 25-meter isobath from Cape Lookout, North Carolina south to West Palm Beach, Florida, shallow coastal waters, inlets, and estuaries and offshore areas to the 100-meter isobath. For juveniles, EFH is identified in shallow coastal waters, inlets, and estuaries to the 200-meter isobath from Assateague Island at the Virginia-Maryland border (38° N) to Jacksonville, Florida; shallow coastal waters, inlets, and estuaries to the 500-meter isobath continuing south to the Dry Tortugas, Florida. EFH identified for adults includes pelagic waters offshore the Virginia-North Carolina border at 36.5° N south to Ft. Lauderdale, Florida between the 25- and 200-meter isobaths (NMFS 2006b). Neonate and juvenile dusky sharks may be present within the ROI. Adults are likely to be further offshore and outside the ROI.

Finetooth Shark. The finetooth shark ranges from North Carolina to Brazil, inhabiting inshore waters. Neonate, juvenile, and adult life stages of finetooth shark have EFH identified in shallow coastal waters of South Carolina, Georgia, and Florida out to the 25-meter isobath from 33° N to 30° N (NMFS 2006b). All life stages may be present in the ROI.

Lemon Shark. The lemon shark inhabits shallow coastal areas, particularly around coral reefs. They are more abundant in waters off South Florida, however, some adults are known to stray north to the Carolinas and Virginia in the summer. EFH is identified for the neonate life stage of lemon shark to include all shallow coastal waters, inlets, and estuaries out to the 25-meter isobath from Savannah, Georgia at 32° N, south to Indian River Inlet, Florida at 29° N. For juveniles, EFH is identified for all shallow coastal waters, inlets, and estuaries offshore to the 25-meter isobath, west of 79.75° W from Bull's Bay, South Carolina to south of Cape Canaveral/West Palm Beach, Florida. EFH identified for adults includes all shallow coastal waters, inlets, and estuaries offshore to the 25-meter isobath from Cumberland Island, Georgia at 31° N to St. Augustine, Florida at 31° N (NMFS 2006b). Adults may be present in the ROI during summer months.

Nurse Shark. The nurse shark is a shallow water species ranging from tropical West Africa and the Cape Verde Islands in the east, and from Cape Hatteras to Brazil in the west. It congregates in large numbers and inhabits coral reef areas, typically lying motionless on the bottom under reefs or rocks. EFH for the neonate life stage of nurse shark occurs outside the ROI. For juveniles and adults, EFH is identified as shallow coastal waters (from the shoreline to the 25-meter isobath) off the east coast of Florida from south of Cumberland Island, Georgia (at 30.5° N) to the Dry Tortugas, Florida (NMFS 2006b). Nurse sharks may be present in the ROI but are more likely to be further south of the ROI towards and in the Florida Keys.

Sandbar Shark. The sandbar shark is a bottom-dwelling species inhabiting coastal areas at depths from 20-55 meter and occasionally 200 meters. EFH identified for the neonate life stage of sandbar shark includes shallow coastal areas to 25 meter from Montauk, Long Island, south to Cape Canaveral, Florida (all year). Also included are nursery areas in shallow coastal waters from Great Bay, New Jersey to Cape Canaveral, Florida. For juveniles, EFH is identified for all waters (coastal and pelagic) south of 40° N at Barnegat Inlet, New Jersey, to Cape Canaveral, Florida (27.5° N). EFH identified for adults includes shallow coastal areas from the coast to the 50-meter isobath from Nantucket, Massachusetts south to Miami, Florida (NMFS 2006b). Sandbar sharks may be present within the vicinity of the ROI year round. HAPCs have been designated for sandbar shark to include important nursery and pupping grounds; however, those designated HAPCs are outside the ROI (NMFS 2006b).

Sand Tiger Shark. The sand tiger shark occupies tropical and warm waters of the world as shallow as four meters. EFH is identified for the neonate life stage of sand tiger shark to include shallow coastal waters from Barnegat Inlet, New Jersey south to Cape Canaveral, Florida to 25 meters. EFH is not identified for the juvenile life stage and adult EFH identified occurs outside the ROI (NMFS 2006b). Sand tiger sharks may occur within the vicinity of the ROI, although rarely.

Scalloped Hammerhead Shark. The scalloped hammerhead shark is the most common of the hammerheads, primarily occurring in schools within nearshore tropical waters. EFH is identified for the neonate life stage of scalloped hammerhead shark to include shallow coastal waters of the South Atlantic Bight, off the coast of South Carolina, Georgia, and Florida, west of 79.5° W and north of 30° N, from the shoreline out to 25 miles offshore. For juveniles, EFH is identified as all shallow coastal waters of the U.S. Atlantic seaboard from the ocean shoreline to the 200-meter isobath from 39° N, south to the vicinity of the Dry Tortugas and the Florida Keys at 82° W. EFH identified for adults occurs outside of the ROI (NMFS 2006b). Scalloped hammerhead sharks may occur within the vicinity of the ROI during their seasonal north-south migrations.

Spinner Shark. Spinner sharks travel in schools and range from Virginia to Florida and the Gulf of Mexico. EFH is identified for the neonate life stage of spinner shark to include shallow coastal waters out to the 25-meter isobath, from Cape Hatteras at 35.25° N, around Florida including Florida Bay and the Florida Keys, and north to 29.25° N. For juveniles, EFH is identified off the east coast, from the Florida-Georgia border at 30.7° N south to 28.5° N, from shallow coastal waters to the 200-meter isobath. EFH identified for adults is located just south of the ROI (NMFS 2006b). Spinner sharks may be present within the vicinity of the ROI during their seasonal migrations, although information on migration patterns is limited.

Tiger Shark. The tiger shark occurs in deep oceanic and shallow coastal warm water regions. EFH is identified for the neonate life stage of tiger shark to include shallow coastal areas to the 200-meter isobath from Cape Canaveral, Florida north to off Montauk, Long Island, New York. For juveniles, EFH is identified as shallow coastal areas from Mississippi Sound (just west of Mississippi-Alabama border) to the 100-meter isobath south to the Florida Keys; around the peninsula of Florida to the 100-meter isobath to the Florida-Georgia border. EFH identified for adults includes the offshore areas from Chesapeake Bay south to Ft. Lauderdale to the western edge of the Gulf Stream (NMFS 2006b). Tiger sharks may be present within the vicinity of the ROI.

3.6.2 Terrestrial Communities

Proposed renovation and construction activities would occur within previously disturbed areas. All areas are paved, contain existing buildings or facilities, or are actively landscaped with a variety of native and non-native trees, shrubs, and grasses. The ROI is within what the INRMP designates as the operational protected area, which also includes the airfield and areas of high human activity (see Section 3.2.4.1), and is not the focus of natural resource management for the Station (DoN 2007b). No sensitive habitats occur within the ROI. Wildlife species present are those typical of urban and human-disturbed environments including green anole, raccoon, gray squirrel, and migratory birds such as common ground dove, mourning dove, song sparrow, red-winged blackbird, house finch, northern mockingbird, and boat-tailed grackle. Other migratory birds occurring within the nearshore and open water areas of the St. Johns River include osprey, double-crested cormorant, brown pelican, pied-billed grebe, and black-crowned night heron. Wetlands near the ROI are limited to (1) a drainage area delineated as a wetland due to its conveyance of water to a wetland habitat not within the ROI and (2) wetland habitats on the southern bank of the NAVSTA Mayport entrance channel.

3.6.3 Federally Threatened and Endangered Species

Eleven species listed as threatened or endangered under the ESA potentially occur within the ROI (Table 3.6-2). The additional species provided in a letter from NMFS regarding species potentially occurring within the ROI (refer to Appendix B.2) were not included in the following analysis as they do not occur within the ROI (e.g., corals, Johnson's sea grass, sperm whale, etc.). Critical habitat has been designated within the ROI for North Atlantic right whale (NRW) and West Indian (Florida) manatee. To support ESA consultation with the USFWS and NMFS, BAs have been prepared to assess the impacts of the proposed action on ESA-listed species and designated critical habitat. The BAs are in Appendix B.3. In addition, one Species of Concern (SOC), Atlantic sturgeon, is included because a determination to list this species may occur during the course of the EIS.

Table 3.6-2 ESA Listed Species and Critical Habitat Potentially Occurring in the ROI

Species	Status	Occurrence in ROI: Duval County Beaches	Turning Basin-Landside	Turning Basin-Marine	Approach and/or Navigation Channels	ODMDSs and Ocean between Dredge Area and ODMDSs
Fish						
Shortnose sturgeon	E	na	na	-	-	-
Atlantic sturgeon	SOC	na	na	-	-	x
Smalltooth sawfish	E	na	na	-	-	-
Sea Turtles						
Loggerhead (nesting)	T	x	-	-	-	-
Loggerhead (marine)	T	-	na	x	x	x
Leatherback (nesting)	E	x	-	-	x	x
Leatherback (marine)	E		na	-	x	x
Kemp's ridley(marine)	E	-	na	-	x	x
Green turtle (nesting)	T	x	-	-	-	-
Green turtle (marine)	E	-	na	x	x	x
Birds						
Piping plover	T	x	-	-	-	-
Wood stork	E	-	-	-	-	-
Marine Mammals						
North Atlantic right whale	E, CH	na	na	-	-	x
Humpback whale	E	na	na	-	-	x
Florida manatee	E, CH	na	na	x	x	-

Notes: CH = critical habitat; E = endangered; T = threatened; SOC = species of concern; na = not applicable; - = not expected to occur; x = expected to occur.
Sources: NMFS 2007a; USFWS 2007a.

3.6.3.1 Marine Fish

Shortnose Sturgeon

Historical distribution has been in major rivers along the Atlantic seaboard from the St. John River in Canada, south to the St. Johns River in Florida and is rarely seen in the off-shore marine environment. Currently, shortnose sturgeon are more prominent in northern river systems and severely depleted in southern river systems. A recovery plan was completed for shortnose sturgeon with little to no population data available for the St. Johns River in Florida (NMFS 1998). Beginning in spring of 2001, the FWRI and USFWS began research on the population status and distribution of the species in St. Johns River. After approximately 4,500 hours of gill-net sampling from January through August of 2002 and 2003, only one shortnose sturgeon was captured in 2002. In addition, after 21,381 hours of gill-net sampling for other species from 1980 through 1993, there were no incidental captures of sturgeon. Therefore, it is highly unlikely that a significant population of shortnose sturgeon currently occurs within the St. Johns River (FWRI 2007b).

Because the St. Johns River is heavily industrialized and the system is dammed in the headwaters, shortnose sturgeon populations may have suffered due to habitat degradation and blocked access to historic spawning grounds. Spawning habitat is rocky or gravel substrate or limestone outcroppings which is very rare in the St. Johns River and associated tributaries. There is no documented reproduction in the St. Johns River and no large adults have been positively identified. Shortnose sturgeon are known to use warm-water springs in other southern rivers, but none have been observed in the numerous warmwater springs found in the St. Johns River system (FWRI 2007b). Therefore, the occurrence of shortnose sturgeons within the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel is considered very unlikely; they would not occur in the offshore areas of the ODMDSs or in transit from the dredge area to the ODMDSs.

<u>Atlantic Sturgeon</u>

A review conducted for Atlantic sturgeon in 1998 led to a decision by the USFWS and NMFS that listing was not warranted. However, the Atlantic Sturgeon Fishery Management Plan imposed a 20 to 40 year moratorium on all Atlantic sturgeon fisheries to allow stocks to return. Stocks were assessed again in 2003 leading NMFS to implement a second review of the species.

The South Atlantic population of Atlantic sturgeon is one of five distinct population segments under review for potential listing. The Atlantic Sturgeon Status Review Team is composed of members from NMFS, USFWS, and U.S. Geological Survey (USGS). The South Atlantic distinct population segment historically supported eight spawning subpopulations inhabiting the St. Johns River, Florida to the Ashepoo, Combahee, and Edisto rivers Basin in South Carolina, of which five subpopulations remain. Threats from dredging, water quality, and commercial bycatch likely lead to a decline in the distinct population segment. From stock evaluation methods, the status review team determined that the South Atlantic distinct population segment was at moderate risk (less than 50 percent chance) of becoming endangered in the next 20 years (Atlantic Sturgeon Status Review Team 2007).

The historic range of the Atlantic sturgeon is from St. Croix, Maine to the St. Johns River, Florida. They spend most of their lives in marine waters and migrate up rivers in February through March to spawn. Due to habitat degradation, the St. Johns River is suspected to serve as only a nursery for existing Atlantic sturgeon that still utilize the waterway system (NMFS and USFWS 1998). Only 37 percent of Atlantic sturgeon habitat still exists in the St. Johns River. It is not currently used for spawning and historical use of the river is unknown (Atlantic Sturgeon Status Review Team 2007). Therefore, it is unlikely that the Atlantic sturgeon will inhabit the waters within the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel. Because the Atlantic sturgeon spends a majority of its life in marine waters, they may be present in the offshore areas in the vicinity of the ODMDSs and in the transit areas between the dredge project area and the ODMDSs.

Smalltooth Sawfish

Smalltooth sawfish inhabit coastal and estuarine shallow waters close to shore with muddy and sandy bottoms, particularly at river mouths. As noted in the Draft Recovery Plan for this species, historic range of smalltooth sawfish was from Florida to Cape Hatteras. The loss of habitat for juveniles and high incidence of bycatch for adults is suspected cause of decline in the population. Current distribution is reduced by as much as 90 percent, with regular occurrence of the species secluded to the southern tip of Florida from the Caloosahatchee River down to the Florida Keys (NMFS 2006a). Therefore, it is considered very unlikely that smalltooth sawfish would occur within the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel; they would not occur in the offshore areas in transit to and in the vicinity of the ODMDSs.

3.6.3.2 Sea Turtles

Sea turtles occur in subtropical ocean waters throughout the world. They are air-breathing but spend a majority of their lives in the water. Adult females will spend the most time on land when they return to beaches to lay their eggs. The turtle species potentially occurring within the ROI include loggerhead, leatherback, Kemp's ridley, and green. Nesting habitat is defined as all beaches adjoining the waters of the Atlantic Ocean, the Gulf of Mexico, and the Straits of Florida and located within Bay, Brevard, Broward, Charlotte, Collier, Dade, Duval, Escambia, Flagler, Franklin, Gulf, Indian River, Lee, Manatee, Martin, Monroe, Nassau, Okaloosa, Palm Beach, Pinellas, St. Johns, St. Lucie, Santa Rosa, Sarasota, Volusia, and Walton Counties; and all inlet shorelines of those beaches (FAC 62B-55.003). Beaches extending from the south jetties of NAVSTA Mayport south through Jacksonville Beach within Duval County are nesting habitat for loggerhead, leatherback, and green turtles.

Although each sea turtle species discussed corresponds with certain nesting beaches in Florida, annual strandings do occur. The Florida Sea Turtle Stranding and Salvage Network is an organization led by NMFS with assistance from FWRI. FWRI biologists collect data on stranded (i.e., dead, sick, or injured) sea turtles in Florida. Strandings are documented between the months of January and August each year. Over the last 10 years, the average strandings occurring annually have been 916. In 2007, 939 strandings of sea turtles were documented (FWRI 2007e). Baseline conditions for loggerhead, leatherback, green, and Kemp's ridley sea turtle are described below.

Loggerhead Sea Turtle

In the southeastern U.S., nesting season for loggerheads begins in early May through early September (Florida Fish and Wildlife Conservation Commission [FWC] 2002). Females lay five or more nests in a single season at high energy, narrow, steeply sloped, coarse-grained ocean beaches. After approximately a two-month incubation period, eggs hatch between late June and mid-November. The hatchlings head to the surf and swim away from land for one to several days until they take refuge in the downward current of surface water of the ocean with floating vegetation such as seaweed to rest and forage. Several months are often spent in these nursery areas until ocean currents move the young turtles further offshore to grow. Between seven and 12 years of age, the juveniles migrate back to nearshore coastal areas to mature until adulthood. Sexual maturity for loggerheads occurs at around 35 years (DoN 2007b).

Surveys conducted in 2006 identified 103 loggerhead nests along Duval County beaches (FWRI 2006a). Loggerheads have nested and continue to nest at NAVSTA Mayport beaches. Surveys began in 1998 with two nests recorded and has since grown to 21 nests and 1,177 hatchlings in 2006, which is the largest on record at the Station (DoN 2007b). Loggerheads may also be present in the vicinity of the ODMDSs.

Leatherback Sea Turtle

Leatherbacks are found in cool as well as subtropical-tropical waters. Although generally a deep-diving pelagic species that feeds on jellyfish, they do move seasonally into coastal waters to feed on large jellyfish that are associated with rivers and frontal boundaries. Nesting occurs from March through July with an incubation period of 55-75 days (DoN 2007b). Leatherbacks typically nest along the beaches from Brevard County south to Broward County, south of the ROI. However, they do nest in low numbers along the beaches of Duval County; two leatherback nests were documented in Duval County in 2003 (FWRI 2006b). The closest documented nesting was at Hanna Park in 2007 of which only one nest was recorded (FWRI 2006a, Mitchell 2007). They are likely to be present in the vicinity of the ODMDSs.

Green Sea Turtle

Because green sea turtles are herbivores and feed primarily on sea grasses and algae, they tend to occur in offshore surface waters as juveniles but as adults feed in more nearshore areas. Nesting season takes place from April through September with an incubation period of approximately two months (FWC 2002;

DoN 2007b). Surveys conducted in 2006 identified four green turtle nests along Duval County beaches (FWRI 2006a); however, there are no records of them nesting at NAVSTA Mayport beaches. One nest was documented as close as Hanna Park in 2004 (FWRI 2006a). They have been recorded in the NAVSTA Mayport turning basin (USACE 2001) and may occur in the ODMDSs.

Kemp's Ridley Sea Turtle

Kemp's ridleys are shallow water benthic feeders and primarily inhabit the Gulf coasts of Mexico and the U.S., and the Atlantic coast of North America as far north as Nova Scotia and Newfoundland. They feed primarily on crustaceans, especially crabs. Kemp's ridley nest infrequently with the highest density of nests occurring in the counties of Brevard to Palm Beach (FWRI 2007d). There are no nests documented for Kemp's ridley in Duval County for the last 25 years. The closest nesting sites have been along Volusia County beaches (FWC 2007). Kemp's ridley have been recorded at nearby Kings Bay, Georgia and therefore may be present in the NAVSTA Mayport entrance channel (USACE 2006). Occurrences within the Navigation channel, offshore waters in the dredge disposal transit area, and in the vicinity of the ODMDSs are expected to be rare.

3.6.3.3 Birds

Piping Plover

Piping plovers can be found during the winter along both the Gulf and Atlantic coasts on open, sandy beaches, tidal mudflats, and sandflats. Although found on both coasts, they are more common along the Gulf of Mexico. A previous winter census stated that approximately 20-30 piping plovers occur along the Atlantic coast from Duval County south to Brevard, St. Lucie, and Miami-Dade counties (Florida Natural Areas Inventory [FNAI] 2001). Designated critical habitat for wintering piping plovers is found to the north of NAVSTA Mayport and the St. Johns River on Fort George Island within Huguenot Memorial Park (USFWS 2001a). Piping plovers are infrequent visitors to NAVSTA Mayport and Duval County beaches, but were observed at NAVSTA Mayport as recently as 2007. Otherwise, they are not expected to occur routinely within the ROI (NAVSTA Mayport 2007b).

Wood Stork

Wood storks nest and forage in estuarine wetlands and are typically seen in North Florida during the nesting season from March through August. Wood storks have been observed along the entrance channel, east of the turning basin (DoN 2007b).

3.6.3.4 Marine Mammals

North Atlantic Right Whale (NRW)

The NRW population was most recently (November 2005 – October 2006) estimated at 396 individuals (North Atlantic Right Whale Consortium 2006). Calving occurs between November and April in the Southeast U.S. Feeding primarily occurs from spring until fall in coastal waters of the northeast U.S. and Canada where their prey (zooplankton) is abundant. Ship collisions and entanglement in fishing gear are the primary causes of injury and death in the population. Additional factors such as habitat degradation, contaminants, predators, and past whaling activities have all contributed to the endangered status of the North Atlantic right whale (NMFS 2007b). As shown in Figure 3.6-2, based on annual surveys from December through March 1985-2007, NRWs are relatively common within the vicinity of the ODMDSs, the area that would be transited between the dredge project area and the ODMDSs, and near the federal navigation channel (Slay *et al*. 2001, 2002; Zani *et al.* 2003, 2004, 2005, 2006; DoN 2007a, North Atlantic Right Whale Consortium 2007). NRWs have been observed in the St. Johns River as recently as February 2007 (DoN 2007a, Right Whale Consortium 2007). From 1991 through 2006 there have been two strandings of NRWs within the ROI (Figure 3.6-3). As shown in Figure 3.6-4, critical habitat was designated in 1994 for the coastal areas of southern Georgia and northern Florida from shore out to 15 nm offshore from the mouth of the Altamaha River, Georgia to Jacksonville, Florida, and then from shore out 5 nm offshore from Jacksonville to approximately Sebastian Inlet, Florida (NMFS 1994). The eastern portion of the federal navigation channel and both ODMDSs are within NRW critical habitat.

Humpback Whale

Western North Atlantic humpback whales are generally found during the summer on high-latitude feeding grounds from southern New England to Norway, and during the winter in the Caribbean, over shallow banks and along continental coasts, where calving occurs. Calving peaks from January through March, with some animals arriving as early as December, and a few not leaving until June. Since humpback whales migrate south to calving grounds during the fall and make return migrations to the northern feeding grounds in spring, they are not expected off the coast of Florida during summer, when they will be on their northern feeding grounds. The coastal region of Florida is not designated as an area of concentrated occurrence for humpback whales (DoN 2002b). Humpback whales have been spotted in the St. Johns River as recently as 2003 and therefore they may be present in the ROI on rare occasions. Based on sightings, strandings, and life history, humpbacks are expected to occur within the offshore areas near the ODMDSs during fall, winter, and spring.

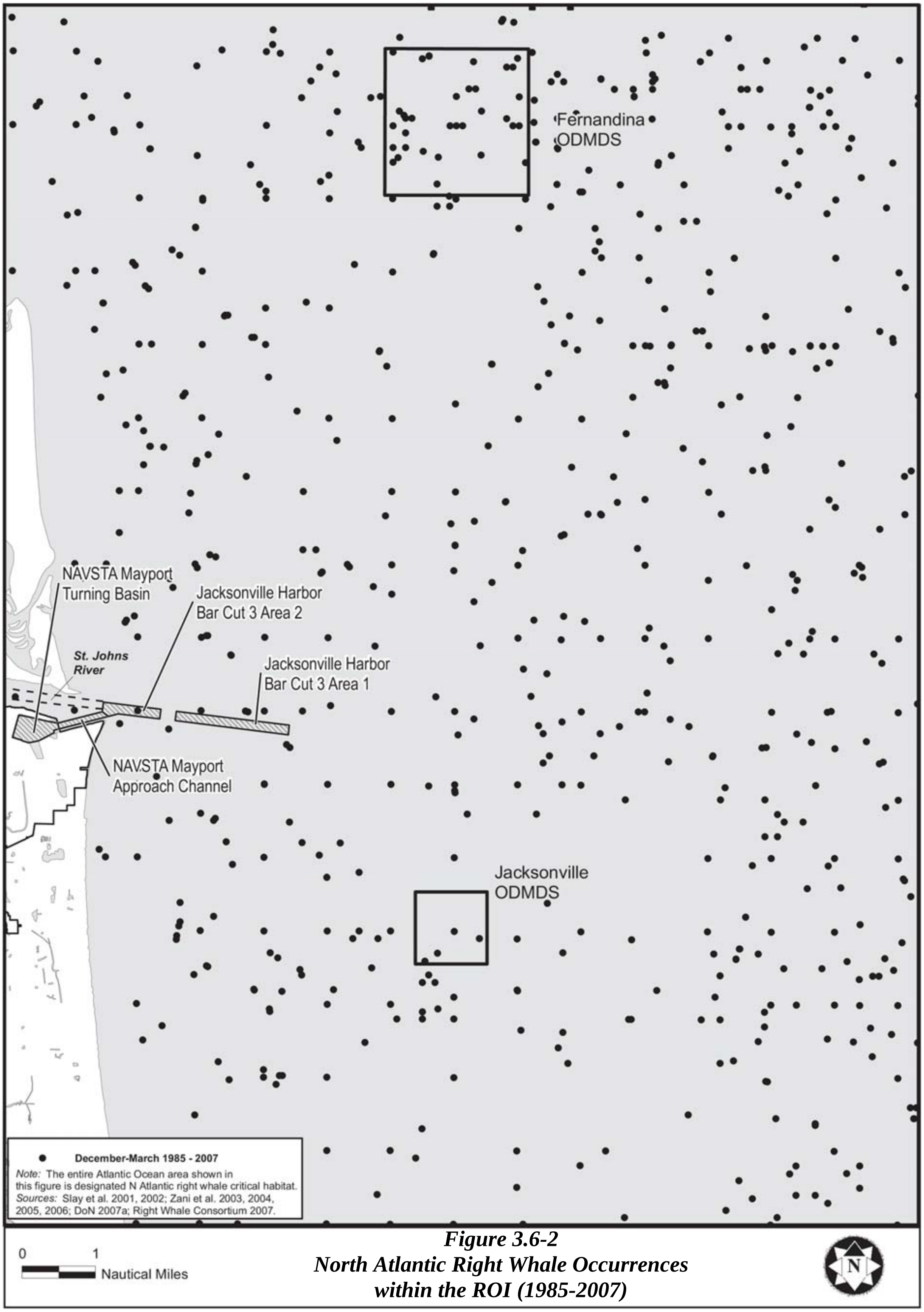


Figure 3.6-2
North Atlantic Right Whale Occurrences within the ROI (1985-2007)

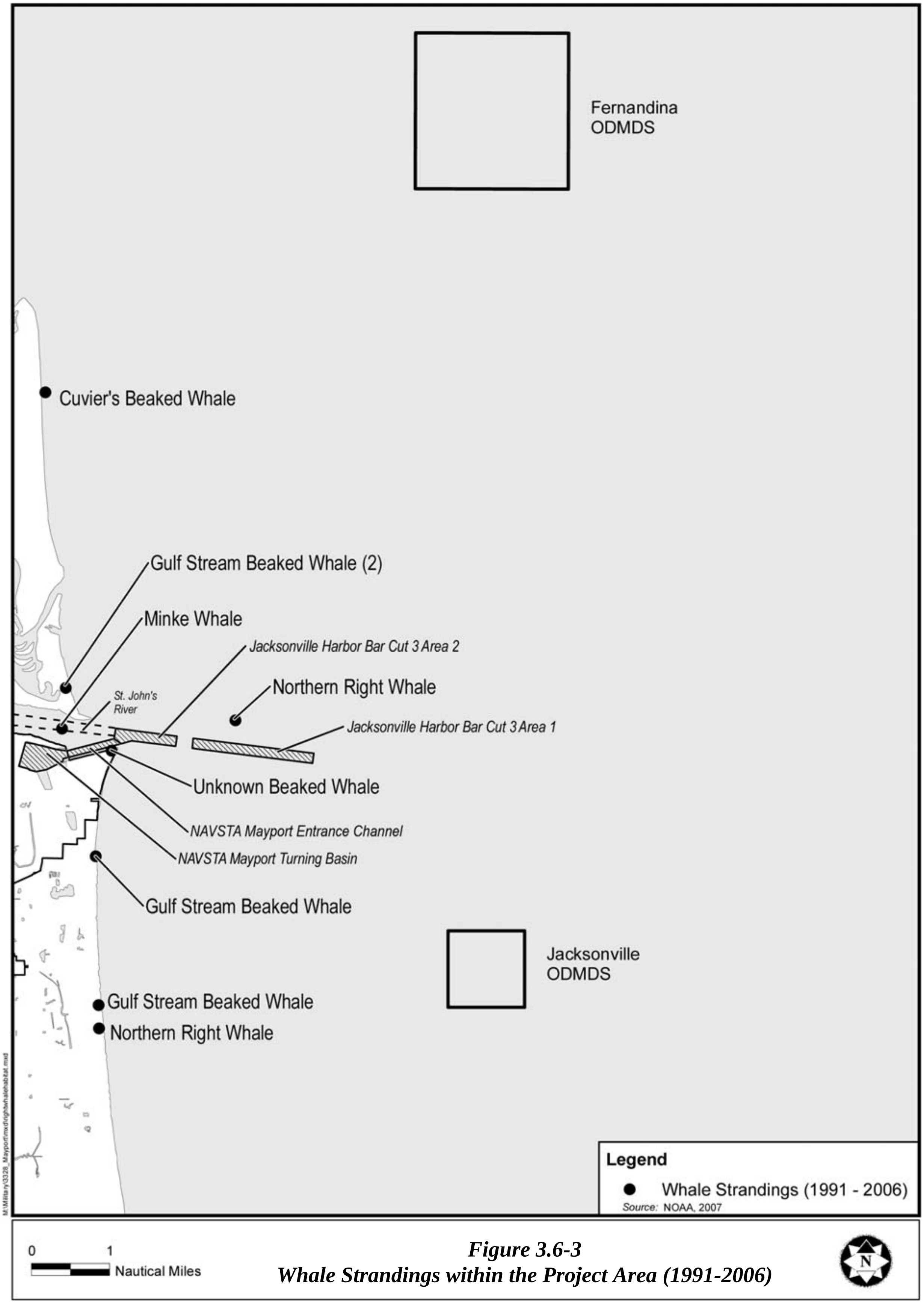


Figure 3.6-3
Whale Strandings within the Project Area (1991-2006)

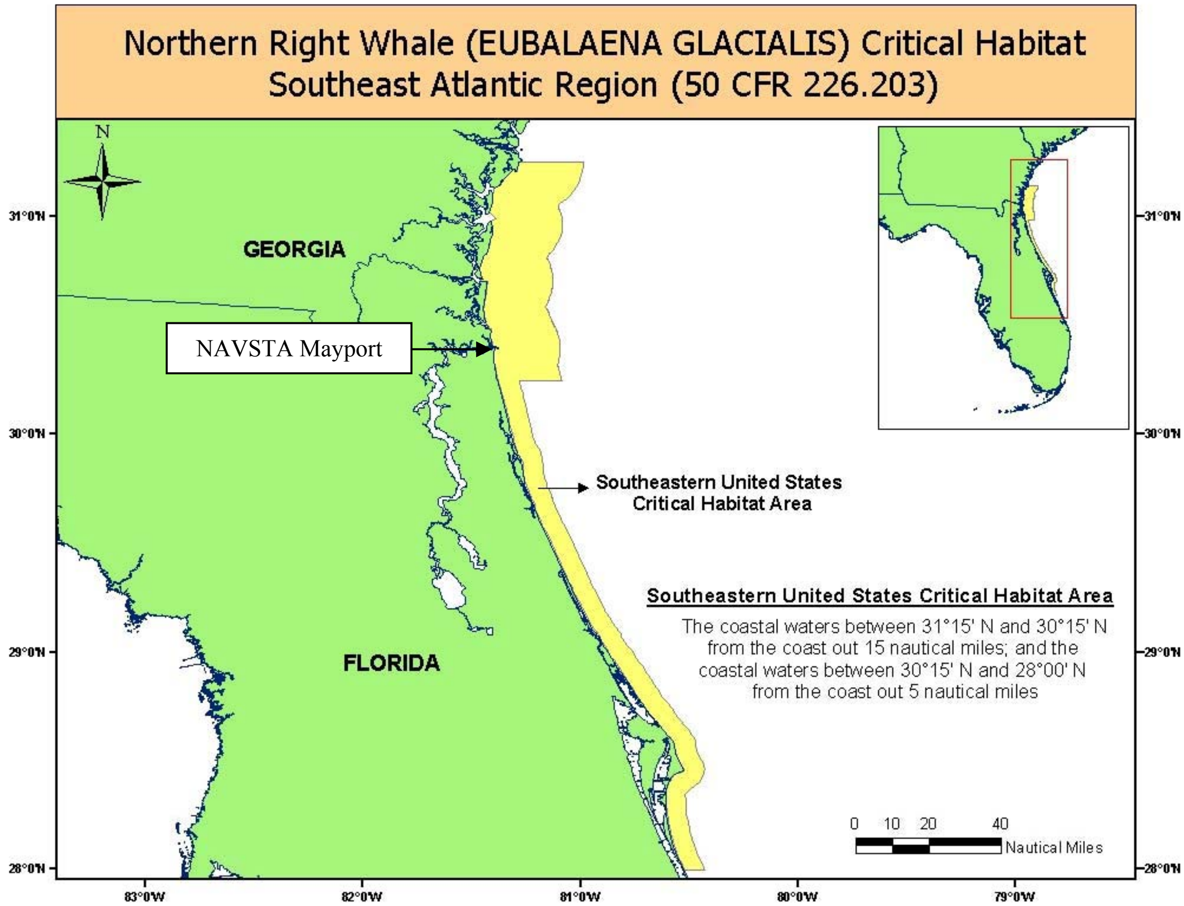


Figure 3.6-4
NRW Critical Habitat – Southeastern United States

<u>Florida Manatee</u>

There are four populations of manatees: Northwest, Upper St. Johns River, Atlantic Coast, and Southwest. The Upper St. Johns River population encompasses the area upstream of Palatka extending to the headwaters of the St. Johns River and is the population most likely to occur within the ROI. Habitat in this area consists of eel grass beds, lakes, and spring fed tributaries. Important springs include Blue, Silver Glen, DeLeon, Salt, and Ocklawaha River (USFWS 2001b, 2007b).

In general, manatees feed primarily on freshwater plants, submerged sea grasses, and plants along shorelines. In northeastern Florida, manatees feed in salt marshes on smooth cordgrass. Springs and freshwater runoff sites are used for drinking water (USFWS 2001b, 2007b).

Manatees use secluded canals, creeks, embayments, and lagoons for resting, cavorting, mating, calving and nurturing their young; and open waterways and channels as travel corridors. Manatees occupy different habitats during various times of the year, with a focus on warm-water sites during winter. They venture from the St. Johns River to the springs in November and reside there until March (USFWS 2001b, 2007b).

Boat traffic and development are the main causes for decline in the population. The Lower St. Johns River Manatee Refuge includes Duval, Clay, and St. Johns counties and has established federal protection for this area against watercraft-related takings. Other causes of injury or death include ingestion of debris, entanglement in fishing gear, cold stress, red tide, and entrapment or crushing in water control structures and navigational locks. Even though manatees are vulnerable in their current environment, recent surveys have shown increases in three of the four population stocks. A five-year review prepared by USFWS concluded that the West Indian manatee no longer fits the ESA definition of endangered and made a recommendation to reclassify it as threatened (USFWS 2001b, 2007b).

Critical habitat was designated for the Florida manatee in 1976 (50 CFR Part 17.95(a)). Designated critical habitat in the vicinity of NAVSTA Mayport encompasses the entire St. Johns River from its headwater to the mouth of the Atlantic Ocean. Therefore the federal navigation channel as far east as the jetties is within the critical habitat.

Two groups of manatees reside in the Jacksonville area. One group remains in the area all winter while the other group moves south during the winter (DoN 2007b). Individual manatees have also been observed on average six times per year near the water treatment plant outfall along the south side of the entrance channel of NAVSTA Mayport (NAVSTA Mayport 2007b). They have been observed in the turning basin of NAVSTA Mayport on occasion (DoN 2007b). They could occur within the nearshore areas to be transited en route to/from the ODMDSs; however, due to the distance from shore of the ODMDSs, manatees would not occur within the vicinity of the ODMDSs.

3.6.4 Other Marine Mammals

Bryde's Whale

Bryde's whales are found both offshore and near the coast in tropical and subtropical waters, in both deep and shallow waters. This species is generally seen alone or in pairs. Bryde's whales are lunge-feeders, feeding primarily on fish, but they also take small crustaceans. There are no confirmed sightings for this species off the north coast of Florida, but there are strandings recorded throughout the year. Bryde's whales are expected to be rare from the coastline to the ODMDSs throughout the year (DoN 2002b).

Bottlenose Dolphin

Bottlenose dolphins are very sociable and are typically found in groups of two to 15 individuals, although groups of 100 have been reported. They are opportunistic feeders, taking a wide variety of fishes, cephalopods, and shrimp. There are two forms of bottlenose dolphins: a nearshore (coastal) and an offshore form. Only the coastal form would occur within the ROI. Bottlenose dolphins are expected to be common within the ROI throughout the year (DoN 2002b).

Atlantic Spotted Dolphin

Group size for the spotted dolphin may range from just a few dolphins to several thousand. They prey on epipelagic (surface dwelling) fish, squid, and crustaceans. Spotted dolphins are expected to be uncommon within the ROI throughout the year from the coastline to the ODMDSs, and continuing to the shelf.

Short-finned Pilot Whale

Short-finned pilot whales are found in warm-temperate and tropical waters and occur primarily along the Atlantic coast south of Cape Hatteras. Strandings along the east coast of Florida have occurred during fall, winter, and spring. As they occur predominantly in the offshore waters of Florida beyond the continental shelf, pilot whales are not expected to occur nearshore or in the vicinity of the ODMDSs (DoN 2002b).

Common Dolphin

Common dolphins occur in temperate to cooler waters from Newfoundland to Florida, but are rarely seen south of Cape Hatteras. Based on the water temperature preferences of this species, there is low potential for occurrence of common dolphins only during the winter, spring, and fall between the coastline and the

ODMDSs and within the vicinity of the ODMDSs. While there are a number of historical stranding records for common dolphins during the summer, there have been no recent confirmed records for this species. They are also considered a shelf-edge species and are not expected to occur in the vicinity of the ODMDSs or between the coastline and the ODMDSs during the summer (DoN 2002b).

Killer Whale

Killer whales normally occur in small groups and feed on bony fishes, sharks, rays, skates, cephalopods, seabirds, sea turtles, and other marine mammals. Killer whale sightings off the coast of northern Florida have been close to shore. However, just to the north off of North Carolina, there are sightings in deep waters seaward of the continental shelf break. Killer whales are expected to be rare throughout the year between the coastline and the ODMDS and within the vicinity of the ODMDSs.

Other Whale Species

Although expected to occur very rarely within the ROI, standings of Gulf Stream (or Gervais') beaked whale, Cuvier's beaked whale, and minke whale have been recorded within the ROI (Figure 3.6-3).

3.7 CULTURAL RESOURCES

Cultural resources are represented by prehistoric and historic sites, buildings, districts, structures, and objects that may be significant on the basis of their association with historic events or persons; that exhibit distinctive characteristics; or that possess the potential to yield important data about the past. For purposes of this discussion, cultural resources are represented by archaeological resources (both terrestrial historic and prehistoric sites and underwater sites), architectural resources, and traditional cultural resources. From the standpoint of legal compliance, the Navy need only consider those cultural resources that qualify as "historic properties" eligible for or listed on the National Register of Historic Places (NRHP or National Register).

Archaeological resources are locations where human activity measurably altered the earth's surface. Typically, archaeological sites are manifested by the physical remains of past activities. At NAVSTA Mayport, archaeological sites span the period from approximately 9,000 years ago to the recent present (Cold War era) and include activities as varied as prehistoric hunting camps, historic nineteenth century turpentine camps, and Cold War era training ranges.

Architectural resources include standing buildings, dams, canals, bridges, and other structures of historic or aesthetic significance. The time period spanned at NAVSTA Mayport is generally from the European Contact Period in Florida (mid-1600s) to the recent past (1950s).

Traditional cultural resources are known resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. Traditional cultural resources may include known archaeological sites, locations of historic events, sacred areas, certain plants, sources of raw materials used to produce tools and sacred objects, traditional hunting or gathering areas, and usual and accustomed tribal fishing grounds. The community may consider these resources essential for the persistence of their traditional culture.

3.7.1 Research Methodology

Under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations (36 CFR 800), only significant historic cultural resources, those that are eligible for or listed on the National Register known as “historic properties” warrant consideration with regard to potential adverse impacts from a proposed federal action. Historic properties generally must be more than 50 years old to be considered for protection under the NHPA. However, more recent structures, such as Cold War era military buildings, may warrant protection if they are “exceptionally significant.”

There are no legally established criteria for assessing the importance of a traditional cultural resource; however, guidelines for identifying and assessing eligibility of traditional cultural resources have been established (National Park Service Bulletin 38 [Parker and King 1998]). These criteria are established primarily through consultation with the affected group. In the American Southeast, such consultations principally occur between the Navy and Native American tribes. It is important to emphasize that affected groups must demonstrate their affinity to the proposed traditional cultural resource on the basis of its recognition and historical standing by the community. As such, newly discovered archaeological sites that were previously unknown to the affected groups cannot be cited as representing a traditional cultural resource, but they can be identified as a cultural resource.

Several other federal laws and regulations have been established to manage cultural resources, including the Archaeological and Historic Resources Preservation Act (1974), the Archaeological Resources Protection Act (1979), and the Native American Graves Protection and Repatriation Act (1990). In addition, coordination with federally recognized Native American Tribes must occur in accordance with EO 13175, *Consultation and Coordination with Indian Tribal Governments* (2000), and the DoD requirements relating to the *Annotated American Indian and Alaska Native Policy* (1999), which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. This policy requires an assessment through consultation of the effect of proposed DoD actions that could significantly affect tribal resources, tribal rights, and Indian lands before decisions are made by the respective services.

The area of potential effects for cultural resources includes the areas likely to be affected by project activities. These areas include the NAVSTA Mayport area of potential development and the dredge area. In order to provide a regional context and to assess whether resources could be found in areas not previously surveyed, cultural resources that are known to occur in the general area are discussed briefly in the following section along with the prehistory and history of the Jacksonville/Mayport area.

3.7.2 Regional Cultural Resources Overview

3.7.2.1 Prehistory of Region

The Jacksonville/Mayport area lies within the East and Central cultural spheres within Florida. Generally, this region stretches northward from south of Cape Canaveral to the St. Mary’s River (Brockington & Associates 1998). Archaeologists divide prehistory of this region into three distinct periods: Paleo-Indian (12,000 B.C. – 7500 B.C.), Archaic (7500 B.C. – 1000 B.C.), and St. Johns Period (1000 B.C. – 1565 A.D.).

<u>The Paleo-Indian Period</u>

Humans most likely entered the southeastern section of North America after 12,000 B.C., but archaeologists date the earliest recorded settlement in Duval County to 8000 B.C. Early inhabitants of this area lived in nomadic bands identified in the archaeological record by distinctive fluted and unfluted stone projectile points such as Clovis, Folsom, and Cumberland. Because of the limited number of sites and artifacts found in the area, it is believed that the northernmost corner of Florida was probably occupied only briefly by small groups of Paleo-Indians (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

<u>The Archaic Period</u>

Environmental and climatic changes during the Archaic Period (7500 B.C. – 1000 B.C.) significantly affected food procurement and settlement patterns of native populations. Distinctive projectile points and the introduction of fiber-tempered ceramics serve as markers dividing the Archaic Period into three sub-periods: (1) Early Archaic, (2) Middle Archaic, and (3) Late Archaic-Orange (Brockington & Associates 1998).

The Early Archaic is characterized by an adaptation to post-glacial environments and the native population's transition from nomadic, big game subsistence/settlement patterns to a more sedentary lifestyle residing along the coastal areas of the seaboard. Projectile point types present during this sub-period included Kirk, Hamilton, Arrendondo, Wacissa, Florida Spike, and Florida Morrow Mountain (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

By 4000 B.C., Florida's climate significantly changed resulting in hot and humid weather. The changing environment provided different food sources and archaeological evidence shows that inhabitants lived on the coast and relied on shellfish. Newman and Hillsborough type projectile points date to this sub-period. These stone tools were probably specialized for the more coastal lifestyle (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

The Late Archaic sub-period underwent another climate change, which resulted in more predictable weather patterns and resources. Late Archaic populations migrated to coastal areas permanently where they relied on horticulture, shellfish, and domestication of floral species as their primary food sources (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

The Late Archaic sub-period is best known for the introduction of two types of fiber-tempered ceramics: Mount Taylor and Orange. The distribution of these ceramic types at sites in different areas was used to identify separate archaeological cultures. By the beginning of the St. Johns Period at approximately 500 B.C., sand was the sole tempering agent for ceramics used by prehistoric populations in Florida (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

Because water levels were lower in the past, it is possible that Archaic sites are located underwater in the vicinity of the project area of potential effects.

<u>The St. Johns Period</u>

Archaeologists divided the St. Johns Period in northeast Florida (1000 B.C. -1565 A.D.) into two sub-periods: Woodland (St. Johns I) and Mississippian (St. Johns II). During the St. Johns I period, native groups relied on hunting, fishing, and gathering of wild plants from freshwater and coastal resources. Villages were located along the St. Johns River and its tributaries and bone and shell tools dominate the archaeological record. During this sub-period an elaborate cult of the dead existed that comprised of burial mound construction and exotic grave goods. Ceramic evidence indicates that this sub-period was dominated by sand-tempered St. Johns Plainswares. The St. Johns I sub-period closed with the introduction of oysters as a primary dietary item and with increased trade with other groups throughout the eastern half of the U.S. (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

The Mississippian Period (A.D. 800-1565), also referred to as St. Johns II, received its formal name from the influence of western populations on settlement organization, ceramic production and decoration, and socio-religious organization in the St. Johns River valley. Villages were oriented around intensive corn agriculture, coastal shellfish and oysters, domesticated floral species, and exotic plants. With these permanent settlements came increased populations and socio-religious activities (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

The St. Johns II sub-period is best distinguished by check-stamped decoration on previously plain pottery. Contact between native groups of eastern and central Florida and the subsequent spread of ceramic technology, social relationships, and agriculture characterized late prehistoric history in the St. Johns River Valley and northeastern Florida (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001).

3.7.2.2 History of Region

<u>Early Mayport and St. Johns River History (1565-1900)</u>

The Timucuan Indians occupied the St. Johns River area in the early 1500s and lived in organized communities, cultivated their own land, and relied on hunting, fishing, and agriculture as food sources. Approximately 25,000 native groups lived in Florida when contact was first made with European explorers. In 1513 Spanish explorer, Juan Ponce de Leon, landed near present day Jacksonville. This event marked the first officially recorded European contact near Mayport (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001). In May 1562, French Huguenot sea captain Jean Ribault and Rene de Laudonniere arrived on the north bank of the River May (Brockington & Associates 1998, Hardy Heck Moore Inc. 2001). In 1564 Laudonniere established a settlement for France along the St. Johns River. He formed an alliance with the Timucuan by offering them defense if they assisted with trade and the construction of Fort Caroline and for three years a friendly relationship was maintained (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998, New South Associates 1994).

In retaliation for repeated raids on Spanish treasure ships by Laudonniere's men, Spanish forces under Pedro Menendez de Aviles attacked the French at Fort Caroline in 1565 and won. The Spanish renamed the settlement Fort San Mateo and immediately constructed two more small forts at the mouth of the St. Johns River, the first of many military bases at the present site of Mayport (Hardy Heck Moore Inc. 2001, New South Associates 1994).

The Spanish consolidated their hold over Florida and its inhabitants throughout the sixteenth and seventeenth centuries. Native Timucuan tribes gradually came under the spiritual and civil authority of the Spanish and the Catholic Church. Colonization, war, and disease virtually eliminated the Timucuan populations in the St. Johns River valley (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998).

During the French and Indian War, the British relinquished control of Havana, Cuba in exchange for Florida. The period of British Florida resulted in increased development of Florida lands toward plantation agriculture, especially along the St. Johns River. Plantations in the Mayport area produced cotton, sugar, oranges, and indigo for export (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998).

Spain regained control of Florida in 1783 as a result of the Treaty of Paris, which ended the Revolutionary War in America. In 1793, Spanish military leaders built a fort named Quesada Battery at the mouth of the St. Johns River to prevent foreign ships from entering the river. Some historians and archaeologists believe the Quesada Battery was constructed on present day NAVSTA Mayport land; however, there is no consensus on where the possible remains are located and no archaeological evidence of the battery has ever been found at NAVSTA Mayport (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998).

In 1814, Andrew Jackson commanded a force of American militia that captured the small Spanish settlement at Pensacola. In 1817, Jackson again led American forces into Florida, pursuing Seminole Indians who raided American settlements in Alabama and Mississippi. Jackson’s slow withdrawal from Florida sparked negotiations between Spain and the United States. The Adams-Onis Treaty was ratified by Congress in 1819 and formally transferred Florida to the United States (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998).

Shortly after Florida became a U.S. territory, American settlers moved into the Jacksonville/Mayport area. This area was very attractive to settlers because conditions for economic development existed in both plantation agriculture and river commerce. However, ship captains often found it difficult to navigate through the rough waters and shoals surrounding the mouth of the river (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998, New South Associates 1994).

Due to increased public demand, Congress appropriated monies to construct a lighthouse to protect ships, goods, and people traveling on the St. Johns River. The first two lighthouses were destroyed by weather and the third one, St. Johns Lighthouse, was built in 1858. This lighthouse is still present on NAVSTA Mayport property and is listed on the National Register (Hardy Heck Moore Inc. 2001, New South Associates 1994).

Shortly after the beginning of the Civil War Union troops occupied Fort Steele, a fort built by Confederate troops on the beach near Mayport and St. Johns Lighthouse, and proceeded to burn most of the Village of Mayport (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998, New South Associates 1994). After the Civil War, Mayport resumed its role as a quiet fishing village and tourist attraction until 1867, when commercial business opportunities re-emerged. The lumber industry revived the St. Johns River economy as northern investors opened sawmills and retail stores throughout Jacksonville. In 1880 the government modified the St. Johns' bar by constructing jetties from large stones, lime rock, and oyster shell on the south and north sides of the river: the south jetty reached 2.5 miles into the Atlantic and the northern jetty began at St. George Island and extended for three miles into the ocean. Completed in 1895, the jetties stabilized the mouth of the St. Johns River and allowed large ships to easily navigate the mouth of the river to Jacksonville (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998, New South Associates 1994).

Early Twentieth Century History (1900-1939)

In the early 1900s, following a rough decade of weather that destroyed cottages and summer homes, Minorcan settlers rebuilt in the area as well as along the immediate coast, and in the present-day Village of Mayport. Minorcan villagers relied heavily on this prime fishing area for their economic survival, and even today, descendants still live and fish in the Village of Mayport. By 1910, areas adjacent to Mayport became resort communities. These areas were located in coves, which protected homes, properties, and businesses from weather-related damage. Summer cottages, elaborate estates, resort hotels, and piers were constructed along the Florida coastline.

In 1938, Congress appropriated millions of dollars towards defense spending that included an increase of the Navy's fleet by 20 percent and naval air strength by 3,000 planes, requiring new installations to support, maintain, and train personnel. In early 1939, the Jacksonville/Mayport area was selected as the site of a new naval base. The first site constructed was called Camp Foster, which was located along the St. Johns River immediately south of present day NAVSTA Mayport; however, Camp Foster did not have sufficient water to allow the approach of aircraft carriers. Eventually, the Navy purchased approximately

900 acres north of Mayport to build a port complex and airfield (Hardy Heck Moore Inc. 2001, Brockington & Associates 1998, New South Associates 1994).

World War II Period (1940-1945)

After the Japanese attack on Pearl Harbor, construction efforts at present day NAVSTA Mayport changed drastically. There was an immediate need for a Naval Section Base in the South Atlantic and funds intended for Mayport were re-routed to Naval Section Base construction efforts. In lieu of constructing a carrier facility at Mayport the Navy dredged Ribault Bay and constructed a small station to be used by patrol craft, rescue boats, and the jeep carriers in 1941 (Hardy Heck Moore Inc. 2001, New South Associates 1994).

By February 1941, Lt. Gordon, the resident officer in charge of construction, had a group of officers and enlisted men involved with site preparation for new construction. All extant homes, businesses, roads, and structures not selected for salvage were razed during this initial construction phase. Many pre-federal buildings were incorporated into the base construction. Lt. Gordon and his team of contractors were faced with dredging Ribault Bay, clearing the densely vegetated land, and constructing bulkheads, barracks, mess halls, administration and training facilities, medical areas, piers, docks, and roads. Standardization in the base design allowed the Navy to quickly construct the necessary facilities. In order to fulfill the building requirements, the Navy purchased an additional 698 acres of surrounding land (Hardy Heck Moore Inc. 2001, New South Associates 1994).

On 20 March 1943, the Navy officially activated the Naval Auxiliary Air Facility (NAAF) Mayport and the base mission was to refuel and rearm aircraft from present-day Naval Air Station (NAS) Jacksonville. By December 1943, the base was complete and fully operational. The Navy redesignated NAAF Mayport as a Sea Frontier base used for maintenance and refueling of submarines and as a homeport for a minesweeping group (Hardy Heck Moore Inc. 2001, New South Associates 1994).

On 1 April 1944, the Navy formally commissioned Mayport a U.S. Naval Auxiliary Air Facility. NAAF Mayport was used to support NAS Jacksonville operations. NAAF Mayport's piers, docks, and airfield remained under the control of NAS Jacksonville; therefore, Mayport functioned more like an Out-Lying Field than a fully operational base. Late in the war, NAAF Mayport opened an anti-aircraft school.

Cold War Period (1945-1980)

NAAF Mayport was deactivated in 1946, a move which was economically devastating to the area. Employment conditions in Mayport worsened in late 1947 when a cut in Coast Guard appropriations forced that service to abandon the former NAAF Mayport facility. The closing of the Coast Guard base eliminated all military operations and employment opportunities in Mayport. Extensive lobbying by local congressmen and representatives resulted in the reopening of the Coast Guard Boat and Air-Sea Rescue unit (Hardy Heck Moore Inc. 2001).

In May 1948, the Navy reclaimed NAAF Mayport from the Coast Guard and announced plans to utilize the base. In September 1948, President Eisenhower signed an emergency appropriation bill that released $17 million in military construction funding for NAAF Mayport, and in 1950 additional construction of the carrier basin began (Hardy Heck Moore Inc. 2001).

The expansion at NAAF Mayport improved the economic well-being of the Village of Mayport, yielding new businesses and increasing employment opportunities. Expansion of the base facilities involved constructing new roads, leveling sand dunes, filling marshes, and changing Ribault Bay from an irregular shaped body of water to three sides of bulkhead. The state of Florida constructed a new highway just west of the base, providing a direct link with Atlantic Boulevard (Hardy Heck Moore Inc. 2001).

During this time the Navy purchased 1,426 acres surrounding the base to accommodate construction of new buildings and structures, developed the Bureau of Yards & Docks plans, and completed the USACE Hydrographic Survey of Ribault Bay. By early 1952, construction at Out-Lying Field Mayport began with the conversion of Ribault Bay into a carrier base. Construction included carrier piers, destroyer slips, repair wharves, bulkheads, and the dredging of Ribault Bay to 40 ft MLLW. The existing runways and aircraft parking area were also expanded (Hardy Heck Moore Inc. 2001).

Present-day NAVSTA Mayport was a boomtown between 1953 and 1960, expanding in operational significance, land area, and new construction. Ribault Bay was dredged an additional two ft so that Midway Class carriers could also utilize the area. All types of naval vessels were finally able to enter St. Johns Bay, allowing Mayport to become a permanent and integral part of America's strategic defense posture. Nine aircraft carriers were either home ported at Mayport or utilized the carrier basin. On 2 October 1956, the Navy designated Mayport as U.S. NAVSTA Mayport. Its new mission was to provide logistic support for the Operating Forces of the Navy, dependent activities, and other assigned commands.

Over the next two decades, NAVSTA Mayport's homeported vessels participated in the recovery of several NASA-related projects and participated in the Cuban Missile Crisis. NAVSTA Mayport was quickly transformed into a staging area for the blockade against Cuba, providing logistic support to squadrons temporarily transferred to the installation. In August 1965, the first ships that were homeported at NAVSTA Mayport departed for operations in Vietnam.

In 1977, during routine dredging of Ribault Bay by the USACE construction crews uncovered a well-preserved 32-pound Civil War cannon. The cannon was one of four carted to Mayport from St. Augustine in 1861. These guns were set up for use at Fort Steele until March of 1862, at which time they were buried, having never been fired at invading Union forces. When examined, it was discovered that the cannon was plugged with an explosive ball and an eight-pound charge of powder. The cannon was moved to the National Park Service offices at Castillo de San Marco in St. Augustine for restoration and exhibit (Hardy Heck Moore Inc. 2001).

3.7.3 Archaeological Resources at NAVSTA Mayport

An overview survey of NAVSTA Mayport was conducted by USACE in 1989 in order to identify the potential for cultural resources to be located aboard the installation. The overview survey concluded that most of the area has been either too disturbed or is too recent a land surface to warrant further archaeological consideration (Greenhorne & O'Mara 1991). Three areas, however, were identified as having archaeological potential: (1) Ribault Village area, (2) St. Johns Lighthouse, and (3) Greenfield Plantation Peninsula. These areas were further investigated and their findings reported in the following archaeological surveys:

- Brockington & Associates, Inc. (1996) conducted a Phase I Historic Resources Survey of the Main Cantonment Dune Line at NAVSTA Mayport. This survey examined the dune line due to its high potential to yield archaeological sites. This survey was located along the dune line between Building 9 and the housing area and covered 133.5 acres.
- Jones *et al.* (2000) conducted a 32.06-acre survey of undeveloped land at NAVSTA Mayport near Ribault Bay Family Housing Complex.
- Godard Design Associates, Inc. (2000) completed the Historic Site Survey of the Village of Mayport. This survey documents the buildings, structures, and sites in the Village of Mayport, Florida, the oldest continually occupied community in Duval County.
- Florida Archaeological Services (1991) completed archaeological testing and monitoring at site 8DU7458. Through testing and monitoring efforts, it was determined that this site is eligible for the National Register.
- Brockington & Associates, Inc. (1998) conducted NRHP evaluation of four archeological sites at NAVSTA Mayport: 8DU7512, 8DU7513, 8DU8116, and 8DU8117.
- Brockington & Associates, Inc. (2000) completed the NRHP evaluation of 8DU78.

In addition to these surveys, NAVSTA Mayport prepared a Historic and Archaeological Resources Protection Plan (HARP) for Naval Complex Mayport (Greenhorne & O'Mara, Inc. 1991) and an Integrated Cultural Resource Management Plan (Hardy Heck Moore Inc. 2001). These reports provide NAVSTA Mayport with guidance in its compliance with the NHPA and federal archaeological protection legislation and recommendations for subsequent archaeological investigations at NAVSTA Mayport.

Known archaeological resources at NAVSTA Mayport include eight sites and one historic cemetery. Of this total, four of the sites and the historic cemetery qualify as historic properties:

- Site 8DU78 – Greenfield Plantation Zones 1-8. This site contains an extensive shell midden and numerous artifacts dating to the prehistoric and historic periods. This site is eligible for the National Register because it has the potential to reveal important information about Native American lifeways.
- Site 8DU296 – St. Johns Lighthouse. This site, located in the northwestern part of NAVSTA Mayport, includes a lighthouse and may have deeply buried prehistoric archaeological deposits. It is listed on the NRHP.
- Site 8DU7458 – Kavanaugh Park. This site is a prehistoric shell midden with diagnostic/datable artifacts. It is considered eligible for the NRHP for its potential to reveal important information about Florida's prehistory.
- Site 8DU7512 – Building 9 Site. This site, situated in the main cantonment area of NAVSTA Mayport, is a prehistoric shell midden and associated artifact scatter. This site has been determined eligible for the NRHP because it has the potential to reveal important information about Florida's prehistory.
- Site 8DU7513 – Broad Street/Old Mayport Cemetery. This site is a historic cemetery of unknown size located under several feet of fill. This site is eligible for listing on the NRHP due to its association with individuals significant in local history.

None of these sites are located within the area of potential effect. Although unlikely, prehistoric or historic resources may be located beneath deep fill deposits at NAVSTA Mayport in the area of potential effects. Prehistoric or historic archaeological sites that may be located in the dredge portion of the area of potential effects are discussed in Section 3.7.6.

3.7.4 Architectural Resources at NAVSTA Mayport

Architectural surveys conducted at NAVSTA Mayport include a complete survey of the built environment through Cold War resources and documentation and preservation of the St. Johns Lighthouse and findings are discussed in the architectural reports listed below.

- USACE (1994b) completed the HARP for NAVSTA Mayport. This document developed a preservation plan for the St. Johns Lighthouse.
- New South Associates (1994) completed a historic building inventory and assessment of NAVSTA Mayport. This study centered on the 20 World War II era buildings and structures at the installation. These buildings were determined ineligible for inclusion in the National Register because they lack sufficient historical and architectural integrity.
- Rosser International, Inc. determined in 1997 that none of the Military Family Housing at NAVSTA Mayport is eligible for the NRHP (Hardy Heck Moore Inc. 2001).
- Hardy Heck Moore Inc. (2001) completed the Integrated Cultural Resource Management Plan for NAVSTA Mayport. This plan included extensive architectural surveys of buildings built before 1991 and included the inventory of 272 buildings, structures, and objects. Aside from the St. Johns Lighthouse, no extant buildings at NAVSTA Mayport were found eligible for the National Register.

All buildings, structures, and objects on NAVSTA Mayport constructed prior to 1991 have been inventoried. One historic property is present: the St. Johns Lighthouse (8DU296). The lighthouse is constructed of load-bearing masonry with a galvanized cast iron framework that supports the lantern and roof. The brick exterior walls are stuccoed and painted. Above the second level, the brickwork corbels out to support a slate-covered platform with steel railing at the third level. A cast iron platform, accessed by an exterior ladder, surrounds the fourth level. A copper covered domed roof with ball ventilator tops the building. The St. Johns Lighthouse is not located within the area of potential effects. The remaining inventoried buildings structures and objects at NAVSTA Mayport have been determined ineligible for the NRHP.

The only land based cultural resource recorded adjacent to the dredge area (part of the area of potential effects) is site 8DU14055, the St. Johns River jetties. This site was originally constructed from 1821 to 1899 and has been identified as potentially eligible to the NRHP.

3.7.5 Traditional Cultural Resources

No traditional cultural resources have been identified at NAVSTA Mayport or the vicinity. The Navy has contacted the following federally-recognized tribes to identify concerns about this project: Seminole Nation of Oklahoma, Seminole Tribe of Florida, Muscogee (Creek) Nation of Oklahoma, and Poarch Creek Indians. The Bureau of Indian Affairs was also notified about the project. To date, no tribes have expressed interest in the project but coordination efforts are on-going.

3.7.6 Underwater Resources

Underwater resources, including shipwrecks, cannons, Native American canoes, and other resources have been found in the vicinity of the St. Johns River entrance and associated tributary rivers and creeks. The Maple Leaf, a Civil War ship, was found in the St. Johns River south of Jacksonville Harbor in 1981. Documentation has shown the presence of 45 ship losses in the St. Johns River (Table 3.7-1). As mentioned in Section 3.7.2, USACE uncovered a Civil War cannon in Ribault Bay in 1977 while dredging.

Table 3.7-1 Known Shipwrecks Located in the Vicinity of the St. Johns River, Florida

Name of Vessel	Vessel Type	Date Lost	Location	Cause
San Andres	Single deck Shallop	Late 1565	St. Johns Bar	Grounded
Unknown	Unknown	1731	Near mouth of St. Johns River	Lost
Dolphin	Steam Side Wheel	19 December 1836	St. Johns Bar	Exploded
Mutual Safety	Steam Side Wheel	11 October 1846	St. Johns Bar	Stranded
Seminole	Steam Side Wheel	20 December 1855	Jacksonville	Burned
Welaka	Steam Side Wheel	2 December 1857	St. Johns River	Stranded
St. Mary's	Steamer	7 February. 1864	McGirts Creek, north of Jacksonville	Scuttled
Maple Leaf	Steam Side Wheel	1 April 1864	Off Mandarin, Florida	Mine Strike
General Hunter	Steamer, Troop Transport	16 April 1864	St. Johns River, near Mandarin Point	Mine Strike
Harriet A. Ward	Steamer	10 May 1864	St. Johns River	Mine Strike
Alice C. Price	Steam Side Wheel	19 June 1864	St. Johns River	Mine Strike
George C. Collins	Steam Screw	27 March 1865	St. Johns River	Stranded
Widgeon	Steam Screw	8 April 1867	Jacksonville	Burned
Miantonomi, Renamed Taminend in 1853	Steam Side Wheel	16 June 1867	St. Johns Bar	Stranded
Sylph	Steam Side Wheel	31 March 1868	Jacksonville	Burned
General U.S. Grant	Steam Screw	2 August 1869	Jacksonville	Burned
Oyster Bay, also reported as Oyster Boy	Steam Screw	24 May 1876	Jacksonville	Burned
Lizzie Baker		April 1880	Mouth of the St. Johns River, north channel	Wrecked

Table 3.7-1 Known Shipwrecks Located in the Vicinity of the St. Johns River, Florida

Name of Vessel	Vessel Type	Date Lost	Location	Cause
Seth Low	Steam Screw	2 November 1881	Jacksonville	Burned
Volusia		2 December 1882	Newnan St.	Boiler explosion
Mechanic	Steam Side Wheel	15 August 1891	Jacksonville	Stranded
J.E. Stevens		26 July 1894	Mayport	Burned
Ravenswood	Steam Side Wheel	31 March 1895	Jacksonville	Lost
Thomas Collyer		11 September 1897	Mayport	Burned
City of Brunswick		1898	St. Johns Bluff	Burned
Ethan Allen	Steam Side Wheel	22 September 1901	Off Jacksonville	Stranded
Commodore Barney		1901/1902	Sank at slip on Newnan St., towed to railroad bridge	Abandoned
Marie Gilbert	Gas Screw	20 April 1907	Masson Bar, near Mayport	Stranded
Martha Helen	Steam Screw	6 February 1910	Jacksonville	Burned
Magic City	Steam Screw	16 February 1910	Mayport	Collided with Parthian
Kennedy	Steam Side Wheel	24 February 1914	St. Johns River	Burned
Richmond	Schooner	5 January 1920	Jacksonville	Stranded
R.B. Trueman	Gas Screw	18 June 1924	Jacksonville	Burned
Comanche	Steam Screw steel	17 October 1925	Jacksonville	Burned
Palatka	Steam Screw	3 December 1926	Mandarin Point	Foundered
Nassauvian	Oil Screw	27 April 1930	Jacksonville	Burned
Utility	Steam Screw	21 February 1932	St. Johns River	Burned
Ruby Lee II	Gas Screw	4 July 1941	Mouth of St. Johns River, near Jacksonville	Stranded
Transfer No. 8	Steam Screw, iron	15 December, 1950	St. Johns River	Foundered
Mermaid	Unknown	Unknown	Jacksonville	Burned
Port Royal	Unknown	Unknown	Jacksonville	Burned while being repaired
Red Wing	Unknown	Unknown	Near Jacksonville	Sank
Everglade	Unknown	Unknown	Jacksonville	Burned
Georgea	Unknown	Unknown	St. Johns River	Burned
Arrow	Unknown	Unknown	South Jacksonville	Sank

Source: Tubby and Watts 1997

The mouth of the St. Johns River has a long history of dredging and channel realignment. The USACE became involved with the St. Johns River entrance in the 1850s when it was decided that dredging would allow ships greater access. These attempts at dredging were unsuccessful as the channel filled up with sediment until it was decided that jetty construction would stabilize the entrance channel. Jetties were subsequently constructed in the 1880s and training walls added to some segments of the riverbank. These are now historic features of the Jacksonville Harbor project. The Rivers and Harbors Act of 1910 authorized excavation of a channel 30 ft deep from Jacksonville to the mouth of the river and a turning basin near Mayport. The depth of the channel was increased to 34 ft in 1945 and to 38 ft in 1965. The authorized depth of the channel at the mouth of the river near NAVSTA Mayport is now 42 ft. Dredging of the turning basin at NAVSTA Mayport and the entrance channel has been an on-going effort since 1942 (Hardy Heck Moore Inc. 2001).

Archival research and remote sensing investigations were conducted for a proposed channel realignment and turning basin construction at Jacksonville Harbor in 1997 (Tubby and Watts 1997). Six areas along the St. Johns River between downtown Jacksonville and the Intracoastal Waterway were examined using a magnetometer and side scan sonar. Magnetic anomalies consistent with historic properties were identified in the areas proposed for channel realignment upstream of Mill Cove. Tubby and Watts (1997) recommended that these targets be avoided. No magnetic anomalies consistent with historic properties were found in the areas between Mill Cove and the western end of NAVSTA Mayport.

In October 2007, a remote sensing survey of the dredging project area was completed (Dolan Research Inc. 2008). The report for this survey is provided in Appendix E.2. The survey area, shown in Figure 3.7-1, included an approximately 500 ft by 5,400 ft area for the NAVSTA Mayport entrance channel, an approximately 700 ft by 3,500 ft area of the federal navigational channel from the NAVSTA Mayport entrance channel to the distal end of the jetties, and an approximately 3,800 ft by 16,000 ft area from the jetties to the east (including a 1,500-ft buffer on either side of the federal navigation channel). Lane (transect) spacing for the areas from the entrance channel to the jetties was 30 meters and lane spacing for the federal navigation channel was 50 meters. This survey and lane spacing was performed in accordance with Florida Division of Historic Resources – Performance Standards for Submerged Remote Sensing Surveys (2001).

While there were no potentially significant targets identified within the NAVSTA Mayport entrance channel or federal navigation channel, all 15 targets suggestive of submerged cultural resources were found outside of the channel in the two 1,500 by 16,000-ft areas beyond the channel that were also surveyed. Two of the 15 survey targets suggestive of submerged cultural resource sites, are located less than 100 ft beyond the edge of the federal navigation channel. The closest of these sites is approximately 75 ft south of the federal navigation channel (Dolan Research Inc. 2008).

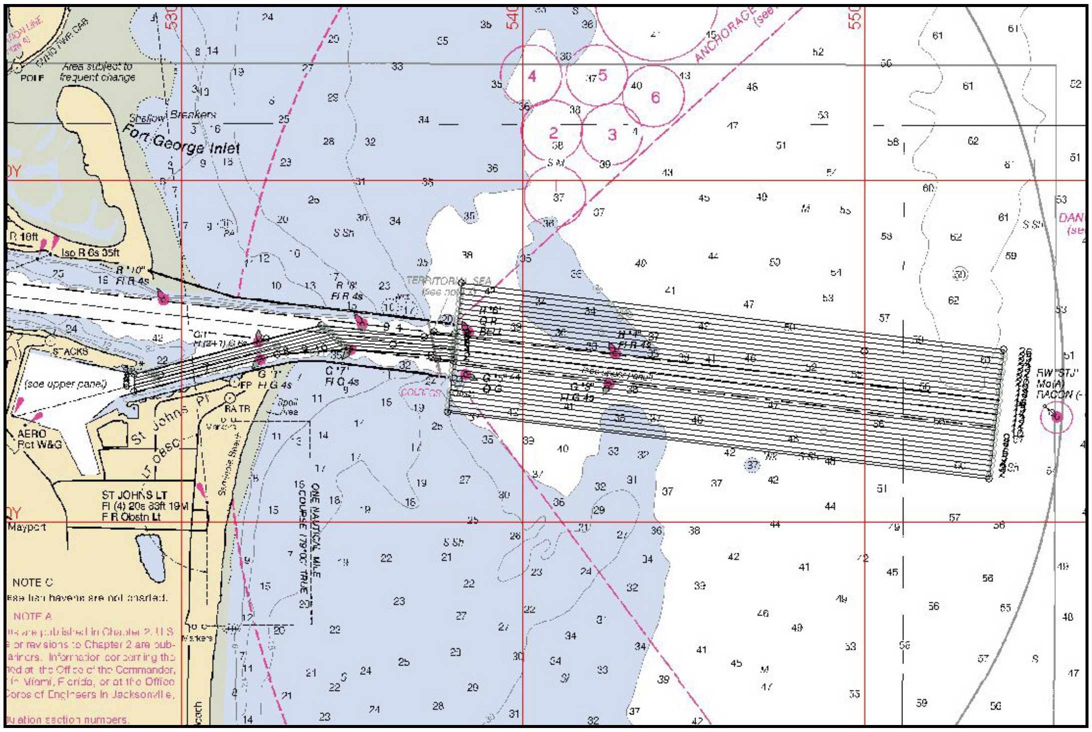


Figure 3.7-1 Underwater Cultural Resource Survey Area

In October 2008, an underwater intensive-level archaeological evaluation was conducted for these two targets and found that neither met criteria for NRHP listing. The executive summary results of this evaluation are provided in Appendix E.3. One target was found to be buried deeper than and beyond the lateral extent of the proposed dredging activity. The second target was positively identified as the remains of a buoy illustrated on charts from 1973 and sunk or lost between 1982 and 1986. The buoy lies outside the current navigation channel and does not represent a significant submerged cultural resource (Southeastern Archaeological Research, Inc. 2008).

3.8 TRAFFIC

The ROI for traffic includes all of NAVSTA Mayport, with an emphasis on the operational and administrative areas of the base, as well as the local road network that provides access points to the Station to include Mayport Road/State Route A1A to north of the interchange with Atlantic Boulevard (south of the Station) and the Wonderwood Connector to near its intersection with Girvin Road (west of the Station) and the St. Johns Ferry (which provides continuation of State Route A1A north of the St. Johns River).

In May 2006, NAVSTA Mayport completed a comprehensive transportation study (Traffic Study) for the naval base (NAVSTA Mayport 2006d). The purpose of the Traffic Study was to provide analysis of existing traffic conditions, and to consider programmed and proposed land use and transportation development scenarios for future conditions. The Traffic Study provided recommendations for short-term solutions to present problems, and long-term improvements to accommodate future development plans and traffic projections (foreseen at that time). It is important to note that the Traffic Study was conducted with a base population of 14,200 personnel. The baseline condition for NAVSTA Mayport for the homeporting EIS is a base population of 16,010 personnel (which translates to an average net daily population of approximately 13,300). This analysis of the existing traffic conditions relies heavily on the outcomes of that Traffic Study but considers the approximate 1,800 personnel difference.

3.8.1 Existing Traffic Conditions

The Traffic Study analyzed 11 intersections and 6 roadway segments on NAVSTA Mayport. The evaluation involved collecting traffic volume data, conducting field analysis of existing geometric roadway conditions, and existing traffic control devices and deficiencies. Traffic volumes and lane configurations were assessed using the Highway Capacity Manual (HCM) methodologies to determine specific Levels of Service (LOS) for each intersection and its control devices. LOS is defined in the HCM as “a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience” (Transportation Research Board 2000).

LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing free flowing operating conditions and LOS F representing heavy congestion and delay. Intersection LOS is based on morning (AM) and afternoon (PM) peak hour data and calculated delay (in seconds) per vehicle. Peak hours are those hours of the day during which the bulk of commute trips occur and traffic impacts are likely to be the greatest. For NAVSTA Mayport traffic, the AM peak hour generally occurs between 6:30 a.m. and 7:30 a.m., and the PM peak hour generally occurs between 3:30 p.m. and 4:30 p.m. (NAVSTA Mayport 2006d). For community-based traffic in the NAVSTA Mayport vicinity, the AM peak hour generally occurs between 7:30 a.m. and 8:30 a.m. and the PM peak hour generally occurs between 4:30 p.m. and 5:30 p.m.

The LOS for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and loss of travel time. Specifically, LOS criteria are stated in terms of the average control delay per vehicle for the peak 15-minute period within the hour analyzed.

The average control delay includes initial deceleration delay, queue move-up time, and final acceleration time in addition to the stop delay. The LOS for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. At an all-way stop-controlled intersection, the delay reported is the average control delay of the intersection. At a one-way or two-way stop-controlled intersection, the delay reported represents the worst movement, which is typically the left-turns from the minor street approach.

Along roadway segments, LOS is based on the average daily traffic volume on a roadway and the volume-to-capacity ratio. Average daily traffic is the average number of vehicles that use a roadway segment within a 24-hour period. Volume-to-capacity ratios represent the ratio of the actual traffic volume to the design capacity of the roadway and are used to provide an evaluation of the LOS along a roadway segment.

3.8.1.1 Access Points

NAVSTA Mayport is bordered on the east by the Atlantic Ocean, on the north by the St. Johns River, on the west by State Highway A1A, and to the south by Wonderwood Drive. Access into the installation is currently provided at three locations:

1) Main Gate — provides access from Mayport Road/ State Route 223 to Maine Street (inside the gate);

2) Seminole Gate — provides access through Kathryn Abbey Hannah Park via Seminole Road to Baltimore Street (inside the gate); and

3) Gate 5 — provides access from Ocean Street/ State Route A1A to Patrol Road (inside the gate) in the southwest corner of the base near the airfield. This is also the commercial truck access gate.

3.8.1.2 Internal Roadway Network

There are three primary classifications for the existing roadway network at NAVSTA Mayport:

1) Arterial Roadways: Maine Street (inclusive of what is sometimes referred to as New Maine Street, where this arterial veers to the west);

2) Collector Roadways: Massey Avenue, Moale Avenue, and Baltimore Street; and

3) Local Roadways: remaining NAVSTA Mayport transportation network.

Arterial and collector roadways are depicted in Figure 3.8-1. The Traffic Study reported morning (AM) and evening (PM) peak-hour (commuter) and 24-hour traffic volume counts. The peak-hour volumes were recorded through a combination of manual intersection Turning Movement Counts (TMCs), and Automatic Traffic Recording (ATR) devices on several installation roadways. The TMCs were conducted at the following intersections:

- Maine Street and Massey Avenue;
- Maine Street and Moale Avenue;
- Massey Avenue and Bon Homme Richard Street;
- Massey Avenue and Baltimore Street;
- Bailey Avenue and Bon Homme Richard Street;
- Bailey Avenue and Baltimore Street;
- Moale Avenue and Everglades Street;
- Moale Avenue and England Street;
- Moale Avenue and Oriskany Street;
- Moale Avenue and Baltimore Street; and
- Supply Avenue and Massey Avenue.

The TMCs were generally conducted weekdays between the hours of 0615 and 0745, and again between 1515 hours and 1645 hours to capture peak hour travel. The ATR devices were placed on the following base roadways during the weekdays: Maine Street, Massey Avenue, Moale Avenue, Bailey Avenue, Baltimore Street, and Bon Homme Richard Street. The result of the TMCs and the ATRs provides a snapshot of the existing traffic flow conditions on the base. The Average Annual Daily Traffic (AADT) was recorded as follows:

- Maine Street: 9,294 northbound/10,282 southbound;
- Massey Avenue: 6,910 eastbound/6,557 westbound;
- Moale Avenue: 1,632 eastbound/1,798 westbound;

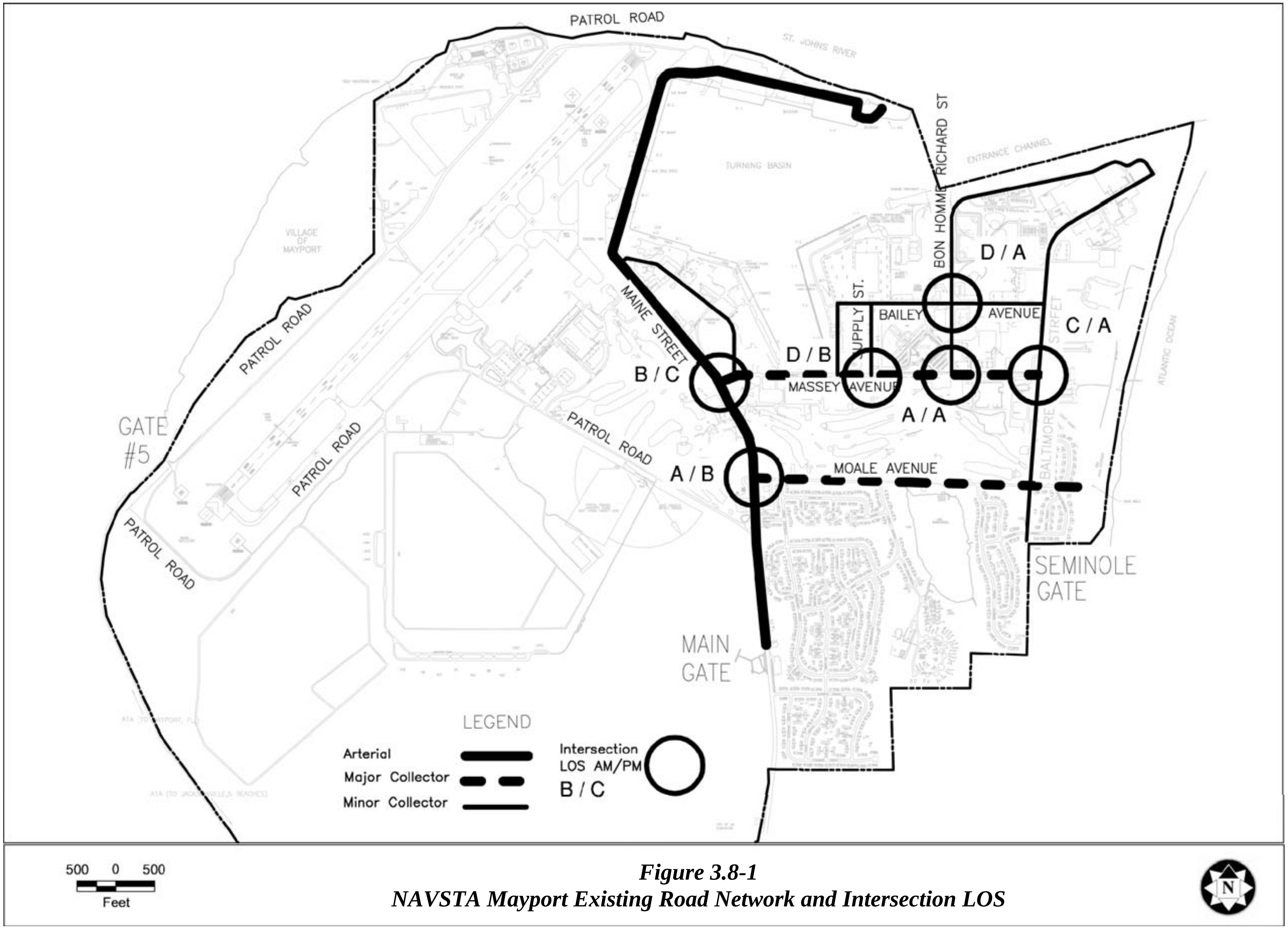


Figure 3.8-1
NAVSTA Mayport Existing Road Network and Intersection LOS

- Bailey Avenue: 1,733 eastbound/1,650 westbound;
- Baltimore Street: 2,284 northbound/2,877 southbound; and
- Bon Homme Richard Street: 3,123 northbound/2,887 southbound.

This data indicate that Maine Street carries the bulk of the northbound/southbound traffic and that Massey Avenue carries the majority of the eastbound/westbound daily traffic. The highest AADT was on Maine Street southbound at 10,282 and the lowest was Bailey Avenue westbound at 1,650.

3.8.1.3 Intersection Conditions

A synopsis of the existing intersection conditions reveals that 4 of the 11 intersections had at least one segment (a through movement or a turning movement in any given direction) near or in failure (LOS E or F) at any given period of the day (AM or PM peak hour):

- Massey Avenue and Maine Street;
- Bailey Avenue and Bon Homme Richard Street;
- Moale Avenue and Baltimore Street; and
- Massey Avenue and Supply Avenue.

Even though a segment fails does not mean the whole intersection fails. An average is taken of all segments for their various directions and LOS conditions to provide an overall rating for the intersection, for both AM and PM peak periods. Based on the average ratings (both AM and PM peak periods) for all intersections studied, there were no intersections that completely failed in either period. The intersection LOS for six key intersections is indicated in Figure 3.8-1.

3.8.1.4 Roadway Segments

The six roadway segments were also analyzed for existing conditions. While all the roadway segments had acceptable LOS, the intersections within the various roadway corridors tend to govern or control the roadway conditions. Of the roadway segments or corridors, Massey Avenue (which had an acceptable LOS for the peak hours) experienced a considerable amount of traffic between Maine Street and Supply Road, and Supply Road and Bon Homme Richard Street. The Traffic Study recommended an improvement to this corridor of an additional through lane along Massey Avenue.

3.8.2 Off-Station Traffic Circulation

Vehicular access to NAVSTA Mayport is via several east-west arterials: Wonderwood Drive, Atlantic Boulevard, Beach Boulevard, and J. Turner Butler Boulevard, all of which cross over the Atlantic Intracoastal Waterway. North-south transit is then generally provided by State Road A1A to and from Mayport Road, to the Main Gate, or further northwest to Gate 5.

AADT counts were obtained for various roadways that influence NAVSTA Mayport from the Florida Department of Transportation (FDOT). The recent Wonderwood Drive Connector (completed in 2005), has successfully relieved much of the traffic congestion pressure on east-west roadways accessing NAVSTA Mayport. Table 3.8-1 lists the local primary roadways and their recent historic AADT counts.

Table 3.8-1 Summary of AADT Volumes for Select Roadways in the Vicinity of NAVSTA Mayport

Roadway	Segment/ Counter #	1997 AADT	1998 AADT	1999 AADT	2000 AADT	2001 AADT	2002 AADT	2003 AADT	2004 AADT	2005 AADT	2006 AADT	2007 AADT
Mayport Road / State Route A1A	South of 11th Street[1] (#0032)	42,000	45,000	42,500	46,500	49,000	48,000	48,500	53,000	44,000	39,000	37,000
Mayport Road	0.1 mile North of State Route A1A (#0578)	29,000	29,500	26,000	26,500	26,500	26,500	26,500	31,500	29,500	21,000	17,700
State Route A1A	1 mile North of Mayport Road (#0827)	11,800	9,400	10,200	9,900	11,800	13,500	13,700	13,400	12,800	15,600	14,300
State Route A1A	North of Bayshore Drive[2] (#0828)	4,600	4,400	4,700	4,500	5,200	6,100	6,600	6,500	5,400	5,600	6,500
Wonderwood Drive Connector	East of Girvin Road[3] (#3916)	NA	NA	NA	NA	NA	NA	NA	NA	19,700	21,000	21,500
Wonderwood Drive	East of Regas Drive[4] (#1028)	0	0	0	0	0	0	3,100	3,100	12,100	11,900	13,400

Source: First Coast Metropolitan Planning Office (FCMPO) 2007

Notes: 1. The Mayport Road/11th Street intersection is located just north of the Mayport Road/Atlantic Boulevard intersection.

2. Bayshore Drive is just north of the State Route A1A/Wonderwood Drive interchange.

3. Girvin Road is the first major intersection along Wonderwood Drive west of the Intracoastal Waterway.

4. The Wonderwood Drive/Regas Drive intersection is located just east of the intersection State Route A1A and Wonderwood Drive

Examination of the AADT volumes for arterials in the immediate vicinity of NAVSTA Mayport reveals that most segments have seen a decrease in traffic volume in 2006 and 2007. Two segments of

Wonderwood Drive experienced an increase in volume. These changes are the result of the construction and use of the Wonderwood Drive Connector that connects Wonderwood Drive on the east crossing State Route A1A and the Intracoastal Waterway to Mt. Pleasant and McCormick Roads on the west, providing another east-west connector to Mayport Road and NAVSTA Mayport. This is reflected in the addition of and increase in AADTs for both segments of Wonderwood Drive since 2003.

The St. Johns River Ferry, a passenger and vehicle ferry that crosses the St. Johns River is part of the local transportation network. It connects State Route A1A and State Route 105 (Heckscher Drive) along a 0.9-mile transit between the Village of Mayport and Fort George Island. The ferry dock is located in the Village of Mayport at the termination of State Route A1A (Ocean Drive). The ferry carries vehicles up to five axles (private, commercial, and recreational) and passenger buses. Semi-tractors and trailers are prohibited. The Jacksonville Port Authority (JAXPORT) assumed responsibility from FDOT over the ferry service in October 2007. The ferry operates every day, including holidays. Monday through Friday, the first departure is from the Village of Mayport at 6:00 a.m. and the last departure is from Fort George Island at 7:15 p.m.. On Saturdays and Sundays, the first departure is at 7:00 a.m. from the Village of Mayport and the last departure is from Fort George Island at 8:45 p.m.. Service is every half hour, with some slight variation in the first three departures from both locations. The fee for use of the ferry is from $1 for pedestrians and bicycles to $10 for passenger busses and five-axle vehicles each way (JAXPORT 2007c). In 2005, ridership was 346,400, down from 404,516 the previous year and 450,551 in 2003. The decline in use is in part attributed to the opening of Wonderwood Drive (Florida Times Union 2006).

The Jacksonville Transportation Authority operates a city bus service to NAVSTA Mayport. This bus route transits between Regency Mall (located along Atlantic Boulevard approximately 5 miles east of downtown Jacksonville and 15 miles west/southwest of Mayport) and NAVSTA Mayport. The route is operated seven days a week (every half hour, 4:30 a.m. until 8:00 p.m., Monday through Friday and 7:00 a.m. until 8:00 p.m. on Saturday and Sunday). At NAVSTA Mayport, bus route stops are located at eight key areas of the installation including at the Wharf E/F/SERMC area and Wharf C. This route averages about 45 riders a day (15 to 18 passengers per trip during peak hours). The bus can accommodate about 40 seated passengers (Haley 2008). Regular fare for the bus service is $1.00. In addition, several free Park-N-Ride lots are conveniently located along Jacksonville Transportation Authority bus routes in the area (Jacksonville Transportation Authority 2008).

NAVSTA Mayport supports the federal Transportation Incentive Program to alleviate traffic congestion on the installation. The program covers transportation expenses (up to $100 per month) for military and civil service employees to get to/from home and work. In addition, NAVSTA Mayport has teamed up with the City of Jacksonville and VPSI Commuter Vanpools to offer vanpool opportunities to all personnel (military and civilian) working on the installation. The program teams together 7 to 15 commuters who reside in the same vicinity and allows them to rent a van to commute back and forth to the installation. NAVSTA Mayport has designated parking spaces for the vanpool as a further incentive (NAVSTA Mayport 2008a).

A shuttle bus service, operated by NAVSTA Mayport, continually provides a transit option for on-Station personnel between key services points within the installation (e.g., bachelor housing to the turning basin) and includes stops at off-Station locations (Navy exchange and commissary) (NAVSTA Mayport 2008b). This service reduces on-Station parking and traffic, particularly that generated by military personnel living on-Station.

The City of Jacksonville, Planning and Development Department, contracts traffic counting services to conduct PM Peak Hour volume counts each year for the Concurrency Management System to track roadway segment capacity and LOS data throughout Duval County, including the vicinity of NAVSTA Mayport, but not intersections. Historical data are not maintained and are not available for the 2006 baseline. In lieu of 2006 baseline data, the LOS of roadway segments during the PM Peak Hour period near NAVSTA Mayport as of 8 July 2008 are presented in Table 3.8-2.

Table 3.8-2 Off-Station Road Segments 2008 LOS Near NAVSTA Mayport

Road	From	To	LOS
Mayport Road	NAVSTA Mayport	State Route A1A	B
Mayport Road	State Route A1A	Church Road (Atlantic Beach City Limit)	E
State Route A1A	Ferry Slip	Wonderwood Road	C
State Route A1A	Wonderwood Road	Mayport Road	C
Wonderwood Bridge	Mt. Pleasant Road	State Route A1A	A
Wonderwood Road	Mayport Road	State Route A1A	C
Mt. Pleasant Road	McCormick Road	Girvin Road	C
Atlantic Boulevard	Intracoastal Waterway	San Pablo Road	D
Atlantic Boulevard	San Pablo Road	Girvin Road	C

3.8.3 PARKING

Privately owned vehicle (POV) parking areas at NAVSTA Mayport are in surface lots located around the base. Generally, each building and activity requiring POV parking is provided a surface lot to the extent it can be so located. There are several large surface lots that do not have parking specifically designated for any given building or activity, and in many cases provide parking not just for working conditions, but for recreational or commercial activity too. There are also large parking areas for shipboard personnel for when vessels are in port. Major parking problems exist near the carrier wharves and adjacent to the wharves near the turning basin when ships are in port (DoN 1997).

Baseline calculations do not indicate a parking shortage on the installation. The total amount of parking available exceeds the demand for parking; but the biggest problem is the lack of conveniently located parking (NAVSTA Mayport 2006d). Given the distances from where parking is abundant to individual duty stations or worker destinations, parking is perceived to be a problem. Included in the parking calculations is one remote or "satellite" parking area where shuttle buses are required to collect workers and bus them to their destinations. Satellite lot #1 (located in the northwest of the installation adjacent to the airfield area) contains approximately 177 spaces. Two other satellite lots, containing approximately 697 spaces total, are available for overflow parking with shuttle bus service (these spaces were not included in the parking calculations).

The total number of parking spots for worker and deployed POVs in the baseline condition is 8,323 spaces. Based on the baseline population of approximately 16,010 personnel, there is a demand for approximately 7,871 spaces for workers and deployed personnel. This leaves a net surplus of 452 spaces. Again, however, at issue is not the total quantity of parking available but the location of available parking, in relationship to individual duty stations and worker destinations. Table 3.8-3 shows the calculation for the baseline condition requirement for worker and deployed POV parking.

3.8.4 MARINE VESSEL MOVEMENT

The ROI for marine vessel movement includes the St. Johns River, NAVSTA Mayport entrance channel, and Atlantic Ocean in the vicinity of the ODMDS sites. Maritime traffic consists of commercial, port facilities, military ships, and recreational boating, each of which is discussed in detail below.

3.8.4.1 Commercial

The Port of Jacksonville, located along both banks of the lower St. Johns River, is the largest and one of the busiest deepwater ports on the east coast of Florida, consisting of 27 principal piers and wharves. The JAXPORT operates six piers and wharves and the remaining are privately owned and operated. The Jacksonville marine terminals are mostly located on the west side of the river 21 miles from the mouth and just before the St. Johns River bends south. The Port of Jacksonville is a leading southeastern port that imports and exports a variety of materials and is a major distribution, bulk handling, and railroad center.

Table 3.8-3 Parking Requirements for Baseline Condition Parking Demand Calculations

Baseline Condition		
Ship Personnel – Deployed Parking Allowance	**Planning Factors**	**8,269**
Deployed [1]	33.3	2,756
Bachelors [2]	37.2	1,025
Bachelors with parking requirement [1]	50	513
Ships In-port Parking Allowance		**8,269**
In port at any given time	66	5,513
With parking requirement [1]	50	2,756
Other Station Personnel		**4,706**
With parking requirement [3]	70	3,294
Air Squadrons		**1,531**
Not embarked at any given time [4]		1,091
With parking requirement [1]	50	546
Ships Maintenance Personnel		**1,504**
Parking requirement for shift workers [3]	38	345
Parking requirement for SERMC staff [3]	70	417
BASELINE PARKING SPACES REQUIRED (Workers and Deployed)		**7,871 Spaces**

Sources:
[1] *Navy BRAC supplemental guidance to NAVFAC 2005 P-80 criteria for parking*
[2] *CNIC 2006*
[3] *NAVFAC 2005*
[4] *Poston 2007*

The principle imports include automobiles, petroleum products, coffee, iron and steel products, cement, limestone, chemicals, pulpwood, lumber, alcoholic beverages, and general cargo. The principal exports include paper products, citrus products, naval stores, phosphate rock, fertilizers, feed, clay, chemicals, tallow, scrap metal, and general cargo (NOAA 2006).

Table 3.8-4 lists reported inbound and outbound trips by draft depth for foreign and domestic commercial vessel movements within Jacksonville Harbor in 2005 as stated in the records from the *Waterborne Commerce of the United States, Part 1* (USACE 2007). A trip is classified as a movement from point A to point B, (e.g., moving from Dames Point Marine Terminal to Talleyrand Marine Terminal, see Figure 3.8-2). A draft is defined as the vertical distance between the waterline and the bottom of the hull. In 2005, there were 80,961 reported commercial vessel movements within the Jacksonville Harbor, an average of 6,747 per month. These numbers include the operation of the St. Johns Ferry service (see Section 3.8.2), which is categorized as domestic craft with a draft of less than 18 ft. There are far more domestic than foreign vessel movements in Jacksonville Harbor. In 2006, the Florida Department of Highway Safety and Motor Vehicles reported 610 commercial vessels and 238 dealer vessels registered in Duval County, Florida (see Table 3.8-7).

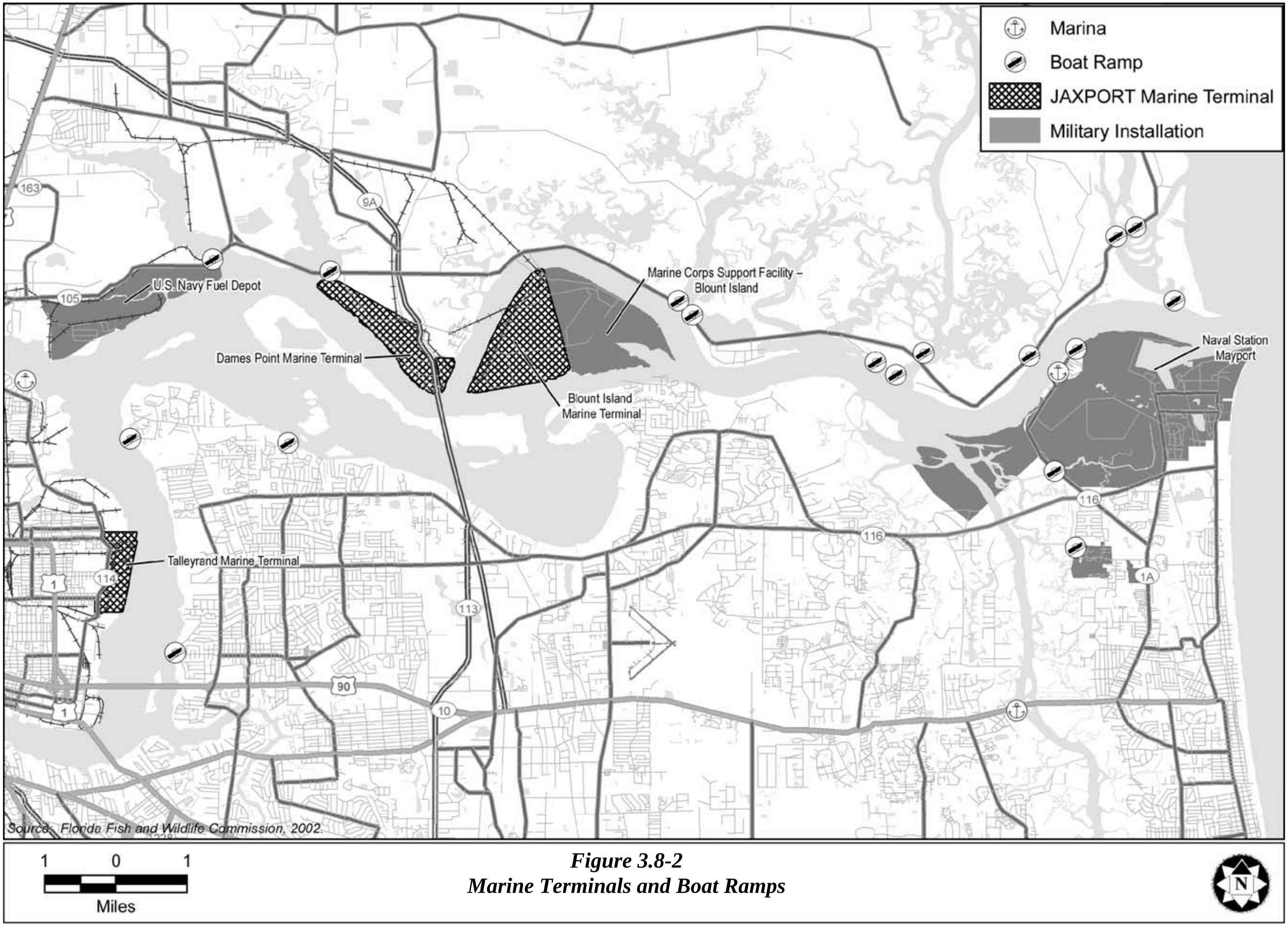


Figure 3.8-2
Marine Terminals and Boat Ramps

Table 3.8-4 2005 Commercial Vessel Movements within the Jacksonville Harbor

Draft	Inbound Trips	Outbound Trips	Total Trips
Foreign			
30 ft - 40 ft	465	266	731
19 ft – 29 ft	926	1,124	2,050
<= 18 ft	158	170	328
Domestic			
30 ft – 37 ft	53	101	154
19 ft – 29ft	153	211	364
<= 18 ft	38,719	38,615	77,852
		Grand Total	**80,961**

Source: USACE 2007

3.8.4.2 Port Facilities

JAXPORT has deepened the St. Johns River shipping channel, which extends from the inlet to Talleyrand Marine Terminal. The shipping channel has been dredged to a maintained depth of -40 ft MLLW in order to accommodate new ships and fully loaded ships that currently call on Jacksonville's port (JAXPORT 2007a). JAXPORT operates six of the 27 piers and wharves in the Jacksonville Harbor at the Blount Island, Dames Point, and Tallyrand marine terminals shown in Figure 3.8-2.

The Blount Island Marine Terminal is approximately nine nm from the Atlantic Ocean and is located on the western half of Blount Island. The Blount Island Terminal is JAXPORT's largest container facility and is used for containers, roll-on/roll-off, and break-bulk (packaged cargo) and general cargo. The JEA jointly owns an unloading facility for coal on the south side of Blount Island with JAXPORT (JAXPORT 2007a).

The Dames Point Marine Terminal is 10 nm from the Atlantic Ocean and handles bulk cargo. In addition, the Dames Point Marine Terminal has a separate temporary cruise operation. Currently, the Dames Point Terminal is under construction and will include a 131-acre container-handling facility with two 1,200 ft berths and six Post-Panamax container cranes (JAXPORT 2007a, b). The Talleyrand Marine Terminal is located 18 nm from the Atlantic Ocean and is used for containers, roll-on/roll-off, liquid, bulk and general cargo (JAXPORT 2007a).

Table 3.8-5 provides the number of vessel calls at JAXPORT, total cargo tonnage, and number of cruise passengers. In 2006, there were 3,754 cargo and cruise vessels in and out of the St. Johns River inlet, an average of 313 per month. Annual cargo vessel calls at JAXPORT from 2002 to 2006 increased by 11.6 percent. According to JAXPORT, in fiscal year (FY) 2006 the port handled nearly 8.7 million tons of cargo, up 22 percent from 2002; and 257,065 cruise passengers, a 50.4 percent increase from the first year of operation in 2004. A new cruise terminal has been proposed east of the Dames Point Bridge (see Section 6.2.3 for more details).

Table 3.8-5 Annual Cargo and Cruise Vessel Statistics for JAXPORT

Year	Cargo Vessel Calls	Total Cargo Tonnage (in millions)	Cruise Ship Calls	Number of Cruise Passengers
2002	1,611	7.11	0	0
2003	1,539	7.30	0	0
2004	1,582	7.68	50	170,927
2005	1,635	8.44	86	275,375
2006	1,799	8.69	78	257,065

Source: JAXPORT 2007a

3.8.4.3 Military

Marine vessel transits at NAVSTA Mayport are defined as movement from the Sea Buoy (located approximately 7 miles offshore) to the NAVSTA Mayport pier (i.e., turning basin). These transits are generated by ships homeported at NAVSTA Mayport, visiting U.S. Navy ships, and other ships including foreign navies, Navy special units, and contractors. In addition, as a tenant aboard NAVSTA Mayport, the U.S. Coast Guard generates vessel transits at the Station. Table 3.8-6 presents three years worth of data for NAVSTA Mayport vessel transits for FY 2005 through FY 2007. On average, there are approximately 600 annual transits at NAVSTA Mayport generated by homeported ships. This represents 47 percent of all annual average vessel transits at NAVSTA Mayport and 56 percent of all Navy annual average vessel transits at NAVSTA Mayport. The 2006 baseline includes approximately 660 transits associated with homeported ships (including the KENNEDY) and a total of approximately 1,000 non-U.S. Coast Guard transits. Total 2006 baseline transits, including the U.S. Coast Guard transits, were 1,170. As compared to the 2006 baseline for ships homeported at NAVSTA Mayport, there were 15 percent fewer transits in FY 2005 and 9 percent fewer transits in FY 2007.

Table 3.8-6 NAVSTA Mayport Vessel Transit Training Activities (FY 2005 – FY 2007)

Generator of Transits	**2005[a]**	**2005[b]**	**2006**	**2007**	**Three-Year Total**	**Annual Average[c]**
Ships homeported at NAVSTA Mayport	421	561	661	599	1,821	607
U.S. Navy ships visiting NAVSTA Mayport	119	159	83	137	379	126
Other visiting ships (e.g., foreign navy, special units, contractors)	286	381	260	400	1,041	347
Total Non-Coast Guard Ships Subtotal	**826**	**1,101**	**1,004**	**1,136**	**3,241**	**1,080**
Coast Guard ships	171	228	166	228	622	207
Total	**997**	**1,329**	**1,170**	**1,364**	**3,863**	**1,288**

Source: USFF 2008b

Notes:
a. The first column of 2005 data covers the 9-month period from November 2004 through July 2005.
b. The full year of FY 2005 data was not readily available. The second column of 2005 data represents the entire year and was derived based on the monthly average from the first set of data (the first set of data was divided by 9 and then multiplied by 12).
c. The three-year annual average includes the second column of 2005 data.

The U.S. Marine Corps Support Facility Blount Island (MCSF-BI) is located on the eastern half of Blount Island. The slipway at MCSF-BI is used in support of the Maritime Prepositioning Force program. The Marine Corps Maritime Prepositioning Force capability consists of 16 civilian operated vessels. The ships are organized into three squadrons, each of which carries equipment and supplies to sustain approximately 15,000 Marines for approximately 30 days. The download/upload process at MCSF-BI is a structured and orchestrated download, maintenance, and upload process of equipment, supply containers, vehicles, and ammunitions. Upon completion of the download process (approximately one week after arrival at MCSF-BI), the ship departs MCSF-BI and travels to an assigned maintenance dry dock for scheduled inspections, maintenance, and painting. The full download/maintenance/upload process takes approximately 60 days. The ship then returns to MCSF-BI to be uploaded and prepositioned. The ships return to MCSF-BI every three years for maintenance of equipment and restocking of supplies. All types of vehicles and/or up to 600 containers are stored on each of the Maritime Prepositioning Force ships.

3.8.4.4 Recreational Boating

As indicated in Table 3.8-7, in 2006, the Florida Department of Highway Safety and Motor Vehicles reported 33,518 vessels for pleasure registered in Duval County, Florida. The total number of registered vessels has remained relatively constant over the years. Between the St. Johns River inlet and the Talleyrand Marine Terminal, there are numerous marinas and public boat ramps. Adjacent to NAVSTA

Mayport in Village of Mayport is the Mayport Boat Ramp and Mayport Marina (see Figure 3.8-2 for the marina and public boat ramp locations).

Table 3.8-7 Registered Vessels in Duval County, Florida

Year	Total Commercial	Total Pleasure	Total Dealers	Grand Total
2000	657	33,637	189	34,483
2001	687	32,807	269	33,763
2002	628	33,113	267	34,008
2003	624	33,268	250	34,142
2004	622	33,072	233	33,927
2005	611	33,223	237	34,071
2006	610	33,518	238	34,366

Source: Florida Department of Highway Safety and Motor Vehicles 2007

A survey conducted by Jacksonville University in 1994 randomly interviewed boat captains at 51 boat ramps in Duval County to determine the primary purpose and destination of the trip. Results indicated for 1,196 recreational boaters (61.6 percent) that recreational fishing was the primary purpose of the trip followed by recreational cruising (18.5 percent). The Mayport Jetties, a popular fishing location (see Figure 3.2-3), was the primary destination with 9.3 percent, followed by 7.4 percent of those polled fishing at Julington Creek (Jacksonville City Council 2006).

3.8.4.5 Offshore Anchoring

Offshore anchorage areas have been established off Fort George Inlet consisting of: anchorages for aircraft carriers and other deep draft vessels (four circular areas each with a radius of 600 yards) and anchorages for destroyers and other ships of similar size (six circular areas each with a radius of 300 yards). One of the four anchorages for aircraft carriers and other deep draft vessels also is designated as an explosives anchorage for use during periods when ammunition must be handled outside the limits of the NAVSTA Mayport. The regulations for all designated areas specify that use of these areas by naval vessels shall predominate only when necessary for military requirements; at such times other vessels shall remain clear of the areas. When the explosive anchorage is occupied by a vessel handling explosives, additional regulations apply including that no other vessel may enter the area unless authorized by the enforcing agency (NOAA 2006).

3.9 SOCIOECONOMICS

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Economic activity typically encompasses employment, personal income and industrial growth. Impacts on these fundamental socioeconomic components can also influence other issues such as housing availability and education.

The ROI for socioeconomics is defined as the area in which the principal effects arising from implementation of the proposed action or alternatives are likely to occur. NAVSTA Mayport is bordered by the Village of Mayport to the northwest, the City of Jacksonville to the south and southwest, and Kathryn Abbey Hannah Park to the southeast. Developed areas to the north and south of NAVSTA Mayport, may be influenced by NAVSTA Mayport activities. The ROI for socioeconomics is Duval County, Florida, including the City of Jacksonville, City of Atlantic Beach, City of Neptune Beach, and the City of Jacksonville Beach. The government of the City of Jacksonville and the government of Duval County consolidated in 1968. Within Duval County, Florida there are three other incorporated areas, City of Atlantic Beach, City of Neptune Beach, and City of Jacksonville Beach. Figure 3.9-1 depicts the socioeconomics ROI.

3.9.1 Demographics

3.9.1.1 Population and Population Growth

As presented in Table 1.3-1, NAVSTA Mayport has a net daily population of approximately 13,300. This translates to a total population of 16,010 (DoN 2006a). The baseline NAVSTA Mayport military population is 89.6 percent enlisted (13,300 personnel) and 10.4 percent officer (1,544 personnel) and the baseline population includes 1,166 contractors (NAVSTA Mayport 2006d, DoN 2006a). Total family members of both military and civilians (in addition to NAVSTA Mayport personnel) are estimated at approximately 24,400. This was calculated using NAVFAC planning criteria (NAVFAC 2005) that provides criteria and guidance for estimating dependent populations based on the distribution and dependent count data by military grade. It was assumed that civilians were similarly distributed by civilian equivalent grade and in dependent distribution. In addition to military and civilian personnel and their dependents, there is a substantial retiree population associated with NAVSTA Mayport.

In 2006, the population of the Village of Mayport was estimated at 265 using Geographic Information System analysis. However, because the Village of Mayport is not incorporated or recognized as a census

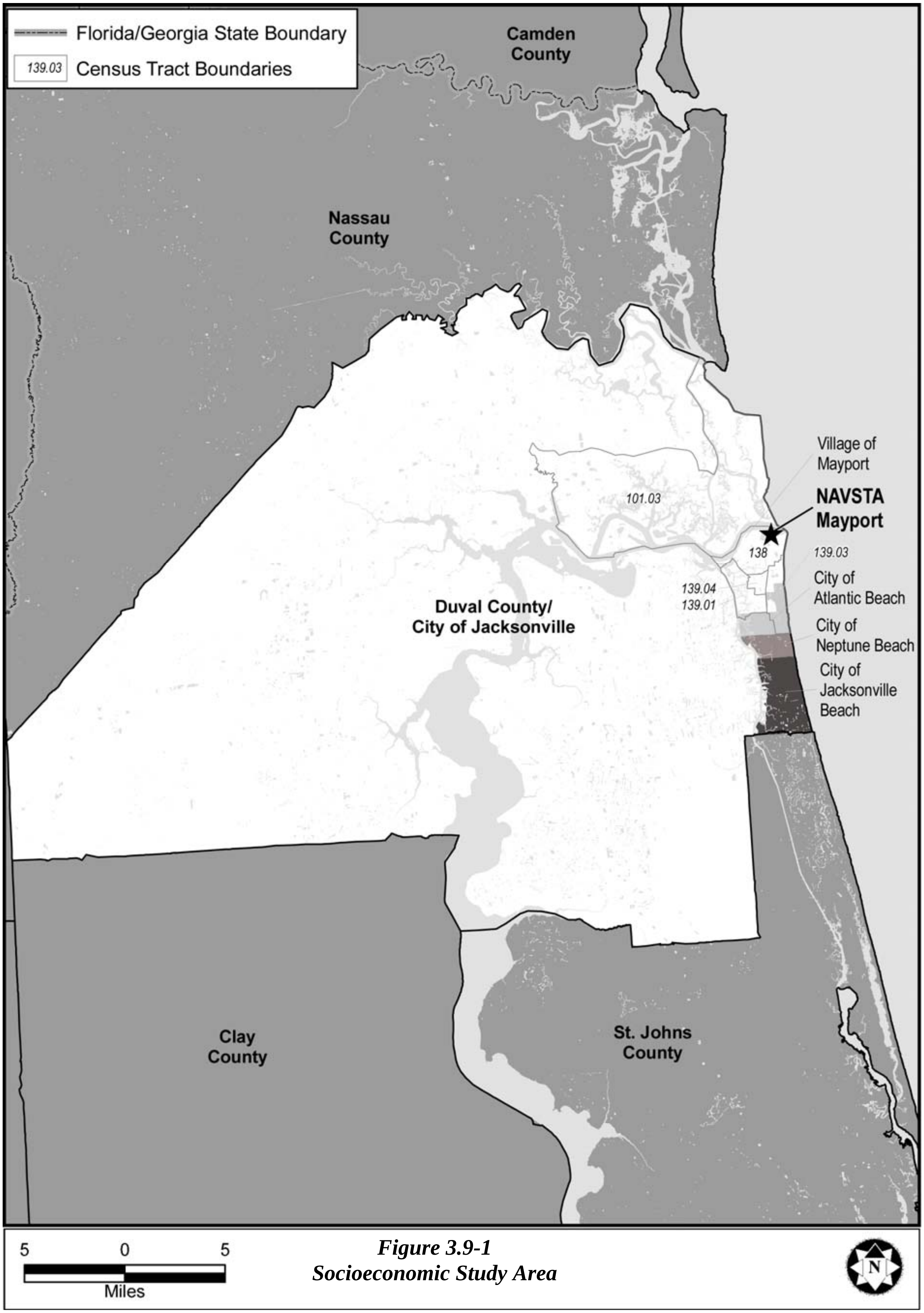


Figure 3.9-1
Socioeconomic Study Area

designated place detailed socioeconomic data are not available for this area. The greater Duval County area 2006 population was estimated at 810,698 with the City of Jacksonville area comprising 768,537 or 95 percent of the population (U.S. Census Bureau 2007g). The population in Duval County and the City of Jacksonville has grown by 36 percent from 1980 to 2000. The population growth of Neptune Beach and Jacksonville Beach mirror Duval County with an increase by 38.5 and 35.7 percent, respectively. In comparison, the population of Atlantic Beach has dramatically increased with a population growth of 70.3 percent. This comparatively greater percent increase for Atlantic Beach is largely attributed to the annexation of the Seminole Beach area (a relatively densely populated residential area) in the 1980s (Doerr 2008). Refer to Table 3.9-1 for population trends for 1980, 1990, and 2000. The population projection for Duval County is 917,943 by 2010 and 1,037,431 by 2020 (JCCI 2006). If Duval County follows these projections, the population would increase by 33 percent from 2000 to 2020.

Table 3.9-1 Population Trends

Locality	1980	1990	2000
Duval County	571,003	672,971	778,879
City of Jacksonville	540,920	635,230	735,617
City of Atlantic Beach	7,847	11,636	13,368
City of Neptune Beach	5,248	6,816	7,270
City of Jacksonville Beach	15,462	17,839	20,990

Source: U.S. Census Bureau 1993, 2007a

3.9.1.2 Veterans

On average the ROI has a greater percentage of civilian veterans than the state of Florida (Table 3.9-2). Of the civilian population residing in the ROI, Neptune Beach has the highest percentage of civilian veterans at 19.3 percent followed by Atlantic Beach (18.3 percent).

Table 3.9-2 Civilian Veterans

Locality	Civilian Veterans (civilian population 18 years and older)	
	Number	Percent
U.S.	26,403,703	12.7
Florida	1,875,597	15.3
Duval County	99,118	17.7
City of Jacksonville	93,045	17.7
City of Atlantic Beach	1,871	18.3
City of Neptune Beach	1,110	19.3
City of Jacksonville Beach	2,920	17.1

Source: U.S. Census Bureau 2007a

3.9.2 Employment

The ROI has a greater percentage of employed individuals than the state of Florida (Table 3.9-3). Within the ROI, Jacksonville Beach and Neptune Beach have the highest percentage of employed individuals (73.4 and 72.2 percent, respectively), while Atlantic Beach has the least (65.0 percent). From 1970 to 2004, 335,797 new jobs were created in Duval County. In comparison to the state of Florida, the job growth in Duval County lags somewhat; however, the job growth has been greater than the nation (USBEA 2004).

Table 3.9-3 Labor Force and Income

Locality	In Labor Force (Pop. 16 years and over)		Median Household Income in 1999 ($)	Per Capita Income in 1999 ($)
	Number	Percent		
U.S.	138,820,935	63.9	41,994	21,587
Florida	7,471,977	58.6	38,819	21,557
Duval County	401,657	67.4	40,703	20,753
City of Jacksonville	376,462	67.2	40,316	20,337
City of Atlantic Beach	7,055	65.0	48,353	28,618
City of Neptune Beach	4,384	72.2	53,576	30,525
City of Jacksonville Beach	13,011	73.4	46,922	27,467

Source: U.S. Census Bureau 2007a

Of the population that is 16 years and older within Duval County, the top employment industries are educational, health, and social services with 16 percent; followed by finance, insurance, real estate, and rental and leasing (13 percent); and retail with 12 percent (Table 3.9-4). The top employer within the Jacksonville metropolitan statistical area (Baker County, Clay County, Duval County, Flagler County, Nassau County, Putnam County, and St. Johns County) is the Navy. This includes NAS Jacksonville, NAVSTA Mayport, and the Navy Fuel Depot in Jacksonville as well as commuters to Submarine Base Kings Bay in Camden County, Georgia (Jacksonville Cornerstone Regional Development Partnership 2006). According to the 2000 Census, 2.7 percent of Duval County's population is in the Armed Forces (U.S. Census Bureau 2007f).

3.9.3 Income

According to the 2000 Census, within the ROI in 1999 the median household income was greater than the state of Florida (see Table 3.9-3). Neptune Beach had the largest median household income at $53,576, followed by Atlantic Beach ($48,353) and Jacksonville Beach ($46,922). The median household income for Neptune Beach was 31.6 percent greater than Duval County. Except for the City of Jacksonville, the per capita income in 1999 for the ROI was greater than Duval County. Neptune Beach also had the greatest per capita income at $30,525 followed by Atlantic Beach ($28,618) and Jacksonville Beach ($27,467).

In Duval County in 1999, 63 percent of individuals earned less than $30,000, while only 3 percent of individuals earned more than $100,000. The income bracket with the largest number of individuals is "$25,000 to $29,000," with 11 percent of the population 16 years and over with earnings (U.S. Census Bureau 2007c). From 1989 to 1999, households that earned more than $100,000 increased from 3 percent to 10 percent while those that earned less than $30,000 decreased from 52 percent to 35 percent. In comparison, in 1989 the largest household income bracket was "Less than $10,000" whereas in 1999 the largest bracket was "$60,000 to $74,999." Adjusting for inflation, the median household income increased by more than 6.3 percent to $40,703 during this 10-year period (U.S. Census Bureau 2007d).

Table 3.9-4 Employment by Industry

Employment Industry	**Number (Pop. 16 years and over)**	**Percent**
Agriculture, forestry, fishing and hunting, and mining	1,301	0.0
Construction	26,110	7.0
Manufacturing	26,450	7.0
Wholesale Trade	15,181	4.0
Retail Trade	44,599	12.0
Transportation and Warehousing, and Utilities	28,535	8.0
Information	13,245	4.0
Finance, Insurance, Real Estate and, Rental and Leasing	48,450	13.0
Professors, Scientific Management, Administration, and Waste Management Services	38,655	11.0
Education, Health, and Social Services	60,299	16.0
Arts, Entertainment, Recreation, Accommodation and Food Services	28,827	8.0
Other Services (except public administration)	17,597	5.0
Public Administration	17,816	5.0
TOTAL	**367,065**	**NA**

Source: U.S. Census Bureau 2007b

According to the 2000 Census, the largest source of income in Duval County is wage or salary income with 78 percent, followed by retirement income at 5.6 percent. The majority of income was derived from labor earnings, including wages and self-employed income (82.2 percent). In contrast, less than 0.1 percent of income was derived from public assistance income (U.S. Census Bureau 2007e).

More recent data on per capita income and wages are available from the U.S. Bureau of Economic Analysis (USBEA) at the U.S., State, and County levels. As inducted in Table 3.9-5, from 2000 to 2005 per capita income increased by 16.6 percent in Duval County and 19.3 percent for the state of Florida. In 2005, the per capita income for Duval County was $33,723; which is 2.2 percent less than the per capita income for the U.S. and 0.8 percent less than the per capita income for Florida.

Table 3.9-5 Per Capita Personal Income (2000 to 2005)

Locality	Per Capita Personal Income ($)					
	2000	**2001**	**2002**	**2003**	**2004**	**2005**
US	29,843	30,562	30,795	31,466	33,090	34,471
Florida	28,507	29,266	29,702	30,290	32,534	34,001
Duval County	28,920	28,884	29,515	30,876	32,400	33,723

Source: USBEA 2008a

In 2000, the average annual wage for NAVSTA Mayport personnel was approximately $23,000. The average annual wage for ships personnel was approximately $20,000 and the average wage for ships maintenance personnel was approximately $30,000 in 2000 dollars (adapted from CNRSE 2001). In comparison, according to the USBEA, the average wage per job in 2000 for Duval County was $32,983. From 2000 to 2006, the average wage per job in Duval County increased by 30.1 percent and by 26.2 percent for Florida (Table 3.9-6).

Table 3.9-6 Average Wage per Job (2000 to 2006)

Locality	Average Wage per Job ($)						
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
US	34,718	35,582	36,150	37,169	38,810	40,172	41,991
Florida	30,296	31,297	32,257	33,360	34,978	36,570	38,226
Duval County	32,983	34,247	35,662	37,324	38,957	40,611	42,919

Source: USBEA 2008b

3.9.4 Housing

According to the 2000 Census, Neptune Beach has the highest housing occupancy rate within the ROI at 94.5 percent, which is slightly higher than Duval County (92.1 percent). Jacksonville Beach has the lowest owner occupied housing units and the highest rate of vacancy and renter occupied housing units within the ROI. Refer to Table 3.9-7 for the 2000 Census housing unit data. NAVSTA Mayport currently has an inventory of 1,164 family houses and total occupancy is estimated at 1,092 (94 percent) (Commander Navy Installations Command [CNIC] 2006). Existing bachelor housing has a capacity to house 1,140 Sailors; a new bachelor quarters under construction will house an additional 312 personnel (McVann 2007b; DoN 2006a). The Navy's Homeport Ashore Program calls for the Navy to provide ashore housing to homeported single Sailors in lieu of on board housing while in port. CNO direction is that all shipboard Sailors, E1 through E3, be housed in ashore bachelor housing. The baseline deficit in bachelor housing at NAVSTA Mayport (with the KENNEDY present) in 2006 was 522 even with counting the new bachelor quarters under construction as part of the existing assets (CNIC 2007).

Table 3.9-7 Occupied Housing Units

Locality	Owner Occupied Housing Units		Renter Occupied Housing Units		Vacant Housing Units		Total Housing Units	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**% Occupied**
U.S.	69,815,753	66.2	35,664,348	33.8	10,424,540	9.0	115,904,641	91.0
Florida	4,441,799	70.1	1,896130	29.9	965,018	13.2	7,302,947	86.8
Duval County	191,734	63.1	112,013	36.9	26,031	7.9	329,778	92.1
City of Jacksonville	179,729	63.2	104,770	36.8	24,327	7.9	308,826	92.1
City of Atlantic Beach	3,719	66.1	1,904	33.9	380	6.3	6,003	93.7
City of Neptune Beach	2,069	63.0	1,213	37.0	190	5.5	3,282	94.5
City of Jacksonville Beach	5,804	59.7	3,911	40.3	1,060	9.8	10,775	90.2

Source: U.S. Census Bureau 2007a

As in most housing markets, residential development in the ROI is cyclical. Over the last two decades, the largest numbers of houses were built in Duval County from 1980 to 1989 (64,850 units). From 1990 to 2000 the new construction rate slowed by 2.5 percent (63,198 units) (U.S. Census Bureau 2007i). Since 2000, when there were 3,773 permits issued for 5,801 units, there has been an upward trend that peaked in 2005, when there were 8,666 building permits issued for 13,507 units. In 2006, there were 6,678 permits issued for 10,083 units (U.S. Census Bureau 2007h).

In 2006, the fair market rent for a two-bedroom apartment in Duval County was $779. In order to afford this level of rent and utilities, without paying more than 30 percent income on housing, a household must earn $31,160 annually. The estimated mean renter's hourly wage in Duval County is $13.11, which translates to an affordable monthly rent of $682. In order to afford the fair market rent for a two-bedroom apartment at this wage, a renter must work 46 hours per week, 52 weeks per year or the household must include 1.1 full time jobs at the mean renter wage (National Low-Income Housing Coalition 2006).

The vacancy rate in Jacksonville's apartment market was 10.2 percent in June 2007, compared with 5.8 percent in June 2006. The higher vacancy rate stems from Jacksonville apartment development hitting a 10-year high with 1,300 new units added to the Jacksonville apartment supply in the first half of 2007. Rent for apartments that have been open for more than one year increased by 0.9 percent. Increases in rent are expected to remain moderate due to the higher vacancy rate (Real Data 2007).

3.9.5 Education

Of the population that is 25 years or older that are high school graduates and/or have obtained a bachelor's degree or higher, Neptune Beach has the highest level of education (93.4 percent high school graduates and 40.3 percent bachelor's degree or higher) for the ROI, which is greater than the state of Florida (79.9 and 22.3 percent, respectively). Within the ROI, Duval County and City of Jacksonville have the lowest high school graduation rates and fewest percentage of individuals who have received a bachelor's degree or higher. However, compared to the state of Florida, both Duval County and the City of Jacksonville have a higher high school graduation rate. Refer to Table 3.9-8 for level of education data from the 2000 Census.

Table 3.9-8 2000 Census Level of Education

Locality	High School Graduates or Higher		Bachelor Degree or Higher		Population 25 Years or Older
	Number	**Percent**	**Number**	**Percent**	**Number**
U.S.	146,496,014	80.4	44,462,605	24.4	182,211,639
Florida	8,804,697	79.9	2,462,328	22.3	11,024,645
Duval County	413,266	82.7	109,473	21.9	499,602
City of Jacksonville	385,300	82.3	98,991	21.1	468,364
City of Atlantic Beach	8,477	89.3	3,675	38.7	9,495
City of Neptune Beach	4,944	93.4	2,133	40.3	5,294
City of Jacksonville Beach	13,875	89.8	4,622	29.9	15,450

Source: U.S. Census Bureau 2007a

3.9.6 NAVSTA Mayport Economic Impact

The impact of NAVSTA Mayport on the local economy is estimated at approximately $1.8 billion annually, which includes payroll, goods and services purchased in the local community, and payments to the military retiree population (DoN 2006a).

3.10 GENERAL SERVICES

This section provides a description of the general services provided at locations within the boundaries of NAVSTA Mayport as well as within the local community to the extent that the served population could be affected by the proposed action and alternatives. General services analyzed include fire and emergency services, law enforcement, health services, recreation, family services, childcare, and education. The focus is on government-provided services to the NAVSTA Mayport population, which includes the approximately 13,300 net daily population of the Station, plus an estimated approximately 24,400 dependents of military personnel (adapted from DoN 2006a and NAVFAC 2005). For the most part, these services are centered at NAVSTA Mayport, but provide service to off-Station military housing areas (Ribault Bay Village and William S. Johnson Family Housing). Ribault Bay Village Housing is located approximately 1.5 miles south of the main gate west of Mayport Road. Johnson Family Housing is located approximately 10 miles from NAVSTA Mayport, near the Atlantic Boulevard/9A interchange south of Craig Municipal Field.

3.10.1 Fire and Emergency Services

The Jacksonville Fire and Rescue Department maintains 55 fire stations and employs 1,047 career firefighters and is supported by 79 volunteer firefighters and emergency medical technicians. Of the 1,047 department employees, 71 percent are in the Fire Suppression Division, 22 percent are in the Emergency Medical Services/Rescue Division, and the rest are in the Fire Prevention, Administration, Training and Emergency Preparedness Divisions. In 2005, the Jacksonville Fire and Rescue Department responded to 109,340 emergency calls. The average response time is 5 minutes and 54 seconds (Francis 2007).

Current fire and emergency services at NAVSTA Mayport provide emergency response and fire fighting capabilities to structural fires, shipboard fires, aircraft rescue for fire fighting response, specialized rescue, and hazardous materials incidents. Services also include primary ambulance response service for the installation; water rescue services; hazardous materials response for spill control and containment; and public fire safety education, inspections, technical services to facilitate contract construction companies and Navy organizations, assistance in arson investigations, and applicable code enforcement (Dietz 2007).

The Fire Department at NAVSTA Mayport handles all calls within NAVSTA Mayport. Forty six personnel provide 24-hour fire protection and emergency response coverage, seven days a week. Five personnel operate the 24-hour/day communications center. The department has a total of five fire companies; including two for structural fire response, two for airfield crash response, and one advanced life support ambulance transport unit (Dietz 2007). Ribault Village fire emergencies are routed through the 911 system and the City of Jacksonville is often the first to respond, but the NAVSTA Mayport fire department also responds. The City of Jacksonville responds to all calls from the Navy's Johnson Family Housing through the 911 system. Reciprocating mutual agreements exist between the Navy and the Jacksonville, Neptune Beach, Jacksonville Beach, and Atlantic Beach fire departments (Dietz 2007).

Basic life support services are provided to NAVSTA Mayport by an on-call unit of military corpsmen from the base medical branch. However, advanced life support may be requested from the City of Jacksonville. In addition, 70 percent of all NAVSTA Mayport firefighters are state-certified emergency medical technicians. As with fire services, the 911 system serves the Ribault Village and Johnson Family Housing communities (Dietz 2007).

3.10.2 Law Enforcement

Duval County and the city of Jacksonville have a single unified, local law enforcement agency, the Jacksonville Sheriff's Office. The Jacksonville Sheriff's Office has 2,977 full time employees, including 1,663 sworn police officers, 691 correctional officers, and 623 civilian officers (Smith 2007).

The Security Department at NAVSTA Mayport has 88 military and 70 civilian personnel. Pier security is supplemented by security personnel aboard ships in port. Ribault Village, because of its proximity to NAVSTA Mayport, is patrolled by NAVSTA Mayport police. The Navy's Johnson Family Housing is under the jurisdiction of the Jacksonville Sheriff's Office. The Navy has no formal mutual aid agreements for law enforcement with the cities of Jacksonville, Jacksonville Beach, Atlantic Beach, or Neptune Beach. However, the informal working relationship between the law enforcement agencies is considered good (Burden 2007).

3.10.3 Health Services

Public health services to the community are provided via the Duval County Public Health Unit. Table 3.10-1 shows the major hospitals servicing the Jacksonville area. The Baptist Medical Center Beaches is the closest hospital to NAVSTA Mayport. In addition, there are 17 outpatient health care centers and two veterans outpatient clinics (Duval County Health Department 2007). The nearest Veterans Administration hospital is in Gainesville, Florida (U.S. Department of Veterans Affairs 2007).

Table 3.10-1 Hospitals Serving the Jacksonville Vicinity

Facility	Location	Number of Beds	Specialties
Hospitals			
Baptist Medical Center Beaches	Jacksonville Beach	98	Inpatient hospital
Baptist Medical Center Downtown	Jacksonville	505	Tertiary hospital
Memorial Hospital Jacksonville	Jacksonville	343	Tertiary hospital
Saint Luke's Hospital	Jacksonville	289	Inpatient hospital
Saint Vincent's	Jacksonville	513	Inpatient hospital
Shands Jacksonville	Jacksonville	566	Hospital, Academic Medical Center
Mayo Clinic	Jacksonville	Patients stay at Saint Luke's	Non-Profit Medical Center
Wolfson's Children's Hospital	Jacksonville	180	Children's Hospital

Source: American Hospital Directory 2007

The Defense Health Program is managed and funded by the Bureau of Medicine & Surgery (BUMED), which is a separate funding source from other installation services. Construction on a new Naval Branch Healthcare Center at NAVSTA Mayport was completed in 2004. The Healthcare Center provides dental and primary care management for military personnel and their dependents. Services include all dental, acute care, women's health, immunizations, treatment of minor injuries and the majority of common illnesses such as colds, sinus infections, hypertension, and diabetes. These clinics have an outpatient pharmacy and a call-in pharmacy refill services. Patients requiring inpatient care are transported to either the Naval Hospital at NAS Jacksonville or civilian hospitals in the area (Bates 2007).

3.10.4 Recreation

Recreational and entertainment amenities in the Jacksonville vicinity include sporting events, museums, musical entertainment, theater, festivals, shops on the waterfront, historical sites, beaches and parks (NAVSTA Mayport 2005). The area also has numerous sporting event fields that support recreational soccer, baseball/softball, and football as well as numerous tennis courts, gymnasiums, and community pools (McDaniel 2007). Kathryn Abbey Hanna Park, at 450 acres in size, is one of the major outdoor recreational facilities in the NAVSTA Mayport area (see Section 3.2).

NAVSTA Mayport also has numerous recreational and entertainment amenities. NAVSTA Mayport Morale, Welfare, and Recreation (MWR) facilities include five parks in addition to other outdoor recreational areas including beaches, tennis courts, four ball fields, a golf course, swimming pools, and running tracks. A gymnasium, fitness center, and bowling alley offer indoor recreation. The installation provides various youth activity, child development, and family service functions. MWR also provides rental recreation equipment and operates an auto hobby shop in addition to Information, Ticket, and

Tours, Navy Exchange Complex (including a credit union, post office, library, laundromat, barbershop, and food service), and the Navy Lodge. The installation also provides fishing facilities at Lake Wonderwood and a skeet/archery range (NAVSTA Mayport 2005).

3.10.5 Family Services

NAVSTA Mayport has a Family Services Center that provides counseling, educational and referral services to military personnel and their families to support fleet readiness. Single and married persons, from E-1s through admirals, can receive Family Services Center services. Programs include: family and marriage counseling, divorce mediation, individual counseling, stress class management, employment assistance programs, transition assistance programs, personnel financial assistance programs, relocation assistance programs, new parent support, family advocacy programs, and a transition bulletin board.

3.10.6 Childcare

NAVSTA Mayport has a Child Development Center that offers traditional day care services as well as a Family Home Child Care program. The Child Development Center has 66 providers that care for approximately 325 children (Schwartz 2007). New requests for these services experience an average waiting list time of approximately 3 months (children 3 years old and older) to 9 months (for infants and toddlers). However, at any given time, there may be immediate openings in the Family Home Child Care program. The Family Home Child Care program is an extension of the Child Development Center. There are currently 20 home care providers that care for approximately 450 children of naval or DoD personnel (Schwartz 2007). The average waiting list time varies but is similar to that of the Child Development Center, and can range from 6 to 9 months. Providers from the program may care for a maximum of six children in their homes. The Child Care Resource and Referral Program is a regional service that will assist Navy and DoD families in their search for contracted and subsidize quality childcare programs in the local area (Schwartz 2007).

3.10.7 Education

3.10.7.1 Community Characteristics

The principal means of school age education for NAVSTA Mayport is through the Duval County Public School System. The school system presently operates 96 elementary schools, 28 middle schools, 19 high schools, 4 alternative schools, 4 charter schools, and 3 exceptional student centers (Duval County Public Schools 2007). There are also 109 private schools and 23 colleges and universities (7 major colleges/universities) in the Jacksonville vicinity (NCES 2007).

In the 2006-2007 school year, the total estimated number of students enrolled in public schools was 125,820. There were approximately 30,000 students enrolled in private schools, and more than 22,000 full-time students enrolled in colleges/universities in the area (Conner 2007). On average, the county public schools have an average occupancy rate of 94 percent. The available seating is primarily located in urban areas, while most of the schools located in the suburban areas are at or near capacity, with the need to rely on portable classrooms (Conner 2007). Student class size limits based on Florida requirements are 25 for elementary, 22 for middle school, and 18 for elementary school (Beaudoin 2007).

In the past two years, Duval County Schools opened one new middle school (2004-2005 school year) and one new elementary school (2006-2007 school year). The school district is planning to open another elementary school in the 2007-2008 school year (Conner 2007). The five-year plan calls for new construction of 64 classrooms at North Shore (elementary and middle), 42 classrooms at Chaffee Road (elementary), 88 classrooms at AAA High School (tentatively planned in the Southside area), 64 classrooms at 103rd (elementary and middle), 64 classrooms at J. Turner Butler/Southside (elementary and middle), 42 classrooms at Bartram Springs (elementary), 42 new classrooms at Waterleaf (elementary), and 54 portable classrooms for all grades (Duval County School District 2006). None of the new schools are planned for the areas near NAVSTA Mayport; Waterleaf Elementary would serve Johnson Family Housing. Portable classrooms would be located throughout the school district.

The total cost of educating a child in Duval County during the 2006 school year was estimated at $6,736. The 2006 school budget was $1,449,325,333. Revenue from state aid totaled $517,197,899 (36 percent of the county school budget), including $201,323,914 from the state lottery and categorical funds; federal aid totaled $116,901,112 (8.1 percent), and property taxes and local effort totaled $441,705,869 (30.5 percent) (Douglas 2007).

School districts receive Federal Education Impact Aid (FEIA) funds as allowed by Public Law 103-382, instead of property taxes that are not paid on federal property by the federal government to state and local governments. Funding is based on the number of federally connected children enrolled in the school district, their place of residence, and their average daily attendance at public schools. For FEIA funds, students are placed in two categories: category "A" students live on federal property with at least one parent who is a uniformed military employee, and category "B" students reside off-base with a uniformed military parent(s) or a civilian parent employed by the military.

The FEIA program reimburses school districts for a portion of the school budget lost through the attendance of federally connected children. In the case of Category A students, the reimbursement is for the loss of property taxes for both residences and places of work. In the case of Category B students, the reimbursement is generally for the loss of property taxes from the workplace and not from residences, since the homeowners typically pay property taxes on their residences. FEIA compensation to Duval County Public Schools for the 2006 school year was $414,023. Of this total, $253,694 represented Category A payment and $160,329 represented Category B payment (Conner 2007).

3.10.7.2 NAVSTA Mayport School-Age Dependents

School-age dependents of military personnel residing in on-base housing and in Ribault Village, 1.5 miles south of NAVSTA Mayport, attend elementary and secondary schools in the Mayport and Beaches area. Table 3.10-2 lists the enrollment and capacity of these schools, and number of federally connected students living on and off-base. Seven elementary schools, two middle schools, and one senior high school serve NAVSTA Mayport. The assumption can be made that, because of the distant location of the two other military bases in Jacksonville, the Category A students attending these schools are dependents of military personnel living at NAVSTA Mayport or Ribault Village. Overall, the number of federally connected dependents (Category A and B) attending these schools total 1,068, or 12 percent, of the total enrollment. The percentages of federally connected enrollment (Category A and B) range from a low of approximately 1 percent at Fletcher High, to a high of 37 percent at Mayport Elementary.

Table 3.10-3 lists the 2006-2007 enrollment, capacity, and number of federally connected students in the nine schools surrounding Johnson Family Housing in Jacksonville. Six elementary schools, two middle schools, and one high school are located near this housing community. The Category A federally connected students in these schools are not dependents of military personnel living at Johnson Family Housing, which is privately owned rental property. Students from Johnson Family Housing would be among the Category B students. Federally connected students total 498, or 4.5 percent of the overall enrollment at these schools. Within individual schools, federally connected enrollment percentages range from a low of 0.6 percent at Sandalwood High to a high of approximately 9 percent at Alimacani Elementary. Federally connected students comprise a larger share of elementary and middle school students than high school students. Among those schools near NAVSTA Mayport with more than 10 percent federally connected students, only Jacksonville Beach Elementary is over capacity. Finegan Elementary is at about 80 percent capacity, Mayport Elementary is at 60 percent capacity and Mayport Middle is at 75 percent capacity. Although Fletcher High School is the most overcrowded, it is attended by the smallest share of federally connected students (see Table 3.10-2). Among those schools near Johnson Family Housing with more than seven percent federally connected students, all but Abess Park

Table 3.10-2 2006-2007 Enrollment, Capacity, and Military Dependant Data for Duval County Schools Near NAVSTA Mayport

School	Student Enrollment	Capacity	Percent Capacity	Federally Connected Students	Category A Students	Category A Percent of Enrollment	Category B Students	Category B Percent of Enrollment	Category A and B Percent of Enrollment
Finegan Elementary	526	658	79.94	306	144	27.38	162	30.80	58.17
Mayport Elementary	570	946	60.25	213	135	23.68	78	13.68	37.37
Mayport Middle	752	999	75.28	246	99	13.16	147	19.55	32.71
Jacksonville Beach Elementary	618	546	113.19	70	25	4.05	45	7.28	11.33
Neptune Beach Elementary	988	1,033	95.64	98	45	4.55	53	5.36	9.92
San Pablo Elementary	513	567	90.48	31	14	2.73	17	3.31	6.04
Seabreeze Elementary	530	588	90.14	22	1	0.19	21	3.96	4.15
Atlantic Beach Elementary	496	645	76.90	22	7	1.41	15	3.02	4.44
Fletcher Middle	1,330	1,167	113.97	30	3	0.22	27	2.03	2.26
Fletcher High	2,617	2,039	128.35	30	16	0.61	14	0.53	1.15
Total	**8,940**	**9,188**	**97.30**	**1,068**	**489**	**5.47**	**579**	**6.48**	**11.95**

Source: Conner 2007

Table 3.10-3 2006-2007 Enrollment, Capacity, and Military Dependent Data for Duval County Schools Near Johnson Family Housing Area

School	Student Enrollment	Capacity	Percent Capacity	Federally Connected Students	Category A Students	Category A Percent of Enrollment	Category B Students	Category B Percent of Enrollment	Category A and B Percent of enrollment
Alimacani Elementary	1,111	942	117.94	97	10	0.90	87	7.83	8.73
Lone Star Elementary	792	713	111.08	63	2	0.25	61	7.70	7.95
Abess Park Elementary	785	830	94.58	61	3	0.38	58	7.39	7.77
Sabal Palm Elementary	1,263	1,154	109.45	96	4	0.32	92	7.28	7.60
Kernan Trail Elementary	741	698	106.16	55	2	0.27	53	7.15	7.42
Brookview Elementary	780	711	109.70	26	8	1.03	18	2.31	3.33
Landmark Middle	1,367	1,665	82.10	44	3	0.22	41	3.00	3.22
Kernan Middle	1,220	1,066	114.45	39	6	0.49	33	2.70	3.20
Sandalwood High	2,980	2,787	106.93	17	2	0.07	15	0.50	0.57
Total	**11,039**	**10,566**	**104.48**	**498**	**40**	**0.36**	**458**	**4.15**	**4.51**

Source: Conner 2007

Elementary (at approximately 95 percent capacity) are substantially over capacity, ranging from 118 percent capacity at Alimacani Elementary to 106 percent at Kernan Trail Elementary (see Table 3.10-2).

In addition to the schools in the proximity of NAVSTA Mayport dependent housing, Duval County Schools estimates that the following federally connected students enrolled in other Duval County schools are associated with NAVSTA Mayport: 563 Category A and 617 Category B elementary school students, 109 Category A and 203 Category B middle school students, and 25 Category A and 41 Category B high school students (Conner 2007). Therefore, the Duval County Schools estimate of NAVSTA Mayport federally connected student population totals 2,626 students (2.1 percent of Duval County Schools enrollment). This share is considerably less than what is estimated according to NAVFAC planning criteria (NAVFAC 2005) and NAVSTA Mayport baseline population, which results in an estimate of 8,123 federally connected students (6.5 percent of Duval County Schools enrollment). There are several possible reasons for this discrepancy. First, not all school age dependants would be expected to be enrolled in Duval County public schools; they may be enrolled in private schools (as approximately 24 percent of Duval County school-age children are) or St. Johns or Nassau county schools or home schooled. Second, the number of federally connected students associated with NAVSTA Mayport in Duval County Schools other than those listed in Tables 3.10-2 and 3.10-3 may be underrepresented in the Duval County Schools estimate. Third, the estimate derived using NAVFAC criteria may overestimate the actual number of school age children since all families are assumed to have school age children and contractor/civilian families are assumed to have the same proportion of school age children as military families.

3.11 UTILITIES

The ROI for utilities encompasses the entire installation, including the wharves, as well as the systems interconnectedness with regional systems and its ability to provide the capacity for the desired utility services in combination with all the other present and future projects. Utility system capacity can be identified by the existing infrastructure in place to provide the current utility services, and can be further described in terms of the supply and demand for those utilities. Existing ships berthed at NAVSTA Mayport connect directly into specific utility systems and connections provided at the wharves, which ultimately tie in to the general utilities infrastructure of the installation.

3.11.1 Energy

3.11.1.1 Electricity

JEA provides electricity to Jacksonville, including NAVSTA Mayport and Atlantic Beach. Electricity is produced primarily by two of the four JEA generating stations in northeast Florida: Northside Generating Station and J. Dillon Kennedy Generation Station, and is distributed through an extensive system of underground and overhead transmission lines. Natural gas, fuel oil, coal, and petroleum coke fuel these generating stations (JEA 2007a). JEA's transmission system is composed of transmission lines, large transformers and a variety of safety and monitoring equipment. Substations are equipped with transformers, breakers, switching equipment, monitoring equipment and safety devices to receive high-voltage power from the transmission system. The voltage is then reduced at the substation for delivery to customers over smaller transformers, wires, switches, breakers and other safety equipment (JEA 2007b).

NAVSTA Mayport receives electrical power through the JEA substation located south of the main gate at the northwest corner of Mayport Road and Wonderwood Drive. The rated continuous load-carrying ability of the NAVSTA Mayport substation is 50 Megavolts-Ampere (MVA) (MVA is calculated by multiplying the voltage rating, kilovolts [kV], of the piece of equipment by its current rating). There currently are two 50 MVA transformers located at the substation. The baseline demand at the NAVSTA Mayport substation is 18 to 20 megawatt hours (MWh). The NAVSTA Mayport substation supplies power to seven circuits that supply the installation (Bass 2007 and Fowler 2007).

Table 3.11-1 provides information about the existing distribution of power at the NAVSTA Mayport Wharves. Electrical upgrades were performed on Wharf C-2 in 2002 to provide the electrical capacity required for later class CVNs (68 and higher) per NAVFAC criteria (Malsch 2006 and Cole 2007).

Table 3.11-1 NAVSTA Mayport Wharf Berthing Power Distribution

Wharf	Electric Potential (Volts [V])	Number of Stations	Current (Ampere) per Station	Number of Connections per Station	Total Number of Connections
A-1	480	1	400	4	4
A-2	480	2	400	14/10	24
B-1	480	2	400	13	26
B-2	480	2	400	13	26
B-3	480	2	400	13	26
C-1	480	2	400	12	24
C-2	480 and 4,160	2/2	400	12/4	24/8
D-1	480	2	400	12	24
D-2	480	3	400	8	24
D-3	480	3	400	8	24
D-4	480	3	400	8	24
E-1, -2, -3	480	3	400	8	24
F-1	480	2	400	12	24
F-2	480	2	400	12	24

Source: Malsch 2006

3.11.1.2 Steam

Steam is generated at NAVSTA Mayport by one boiler plant, located in Building 1241 at Wharf C. The plant has a capacity of 100,000 pounds per hour (lb/hr) and provides steam to Buildings 12, 38, and 50 for heating and to the wharf distribution system. The current demand for ships in port is 13,000 lb/hr (Thurlow 2007). Steam is provided at all wharfs at 155 to 175 pounds per square inch (psi) (Malsch 2006).

3.11.1.3 Compressed Air

Industrial compressed air is generated at the Compressed Air Plant (Building 391). The system is operated as a low pressure air system (110 to 120 psi) distributing the compressed air to Wharves D and E at 110 to 120 psi. A mobile compressor is used to supply compressed air to the other wharves as needed (DoN 1997).

3.11.1.4 Fuel Supply

The Navy Fuel Depot in Jacksonville (see Figure 3.8-2) provides fuel to NAVSTA Mayport. Diesel fuel marine (DFM) and jet petroleum (JP-5) are transported to NAVSTA Mayport on barges then stored in storage tanks for distribution via underground fuel lines. NAVSTA Mayport's on-Station fuel farm has two 1,680,000 gallon (40,000 barrels) DFM storage tanks and two 630,000 gallon (15,000 barrels) JP-5 storage tanks. Fuel distribution lines supply DFM to all wharves and JP-5 to Wharves C and B only (Bragg & Marshall 2007).

3.11.2 Potable Water

The NAVSTA Mayport automated water plant is operated by the Public Works Center Jacksonville Facility Management and Utilities contractor through a computerized control system that continuously monitors system pressure, reservoir levels, chlorine residual, service pump sequencing, and well pump sequencing (USEPA 2006b). The plant is capable of and permitted to treat 10 million gallons per day (mg/d) of water. The demand for potable water at NAVSTA Mayport is approximately 2.3 mg/d, although daily averages change depending on the number and type of ships in port. Potable water is obtained from the Floridan aquifer by three 12-inch diameter, 1,000-ft deep wells located on NAVSTA Mayport with capacities ranging between 2.1 to 2.9 mg/d. The potable water is treated by aeration, which removes hydrogen sulfide, and by chlorination (a process that disinfects the water with chlorine). Withdrawal of the water is authorized by a SJRWMD Consumptive Use Permit.

3.11.3 Sanitary Sewer

Like the NAVSTA Mayport water plant, the on-base Domestic Wastewater Treatment Plant (DWTP) is operated by the Public Works Center Jacksonville Facility Management and Utilities contractor. The DWTP provides secondary treatment of domestic and light industrial wastewater with a permitted design capacity of 2.0 mg/d and current operations average 0.8 mg/d (Oller 2006). The plant is operated under a National Pollutant Discharge Elimination System (NPDES) permit issued by the FDEP. The sewage collection system consists of sanitary sewer line, force mains, pumping stations, and collection and holding tank systems. The average daily generation of wastewater varies with the number of ships in port, but is currently loaded at approximately 42 percent of the permitted capacity. The average generation of wastewater on station is 0.90 mg/d, of which approximately 0.36 mg/d is from berthed ships (Thurlow 2007).

Navy policy prohibits overboard discharge while in port so no discharge occurs from ships berthed at NAVSTA Mayport. Sewage and bilge water (water within the lowest inner part of a ships hull) from ships in port are pumped to pierside risers into a gravity flow and force main collection system. The DWTP collection system consists of multiple lift stations that pump into a primary pumping station, which pumps the wastes to the equalization basin at the DWTP. Bilge water treatment is described in the following Section 3.11.4.

3.11.4 Wastewater Collection (Industrial and Oily)

Oily wastewater from ships includes ballast water, bilge water, various used oils, diesel and JP5 fuel. Oily Waste-Waste Oil (OWWO) disposal is available at all pier risers at NAVSTA Mayport. The pipeline system is designed primarily for the disposal of bilge water using 2.5-inch connections. Oily waste transfer and discharge must be arranged in advance and conducted in accordance with SOPA(ADMIN)MYPTINST 5090.2E. The NAVSTA Mayport Public Works Office contractor receives completed forms for OWWO to ensure the plant can accept the type of waste to be pumped. If the waste is acceptable, the Oily Waste Plant Operators will unlock the appropriate riser and operate the necessary valves. These industrial and oily wastes are collected from ship to shore via hoses into a pier-side collection system consisting of pier risers, lateral and gravity lines that collect and direct the product to one of four lift stations. The lift stations pump to a common force main that ends at the Oily Wastewater Treatment Plant (OWTP) located on NAVSTA Mayport. The OWTP collection and treatment facilities have a design capacity of 0.288 mg/d, an operational capacity of 0.25 mg/d, and a 1-million gallon net storage capacity (Arp 2006). The OWTP currently treats an average of 13 million gallons per year, with the existing combination of ships contributing an average of 105,500 gallons per day (GPD) (Thurlow 2007). Discharge from the OWTP is connected into the DWTP.

3.11.5 Stormwater Drainage Collection

NAVSTA Mayport has a large and varied drainage system, including interconnected ditches and swales (a shallow piece of land that carries stormwater runoff), infiltration areas, stormwater inlets, pipes, and other flow structures, oil-water separators and stormwater ponds. NAVSTA Mayport is subject to four types of stormwater programs to regulate and manage various discharges, each requiring one or more permits described below.

- **Multi-Sector General Permit (MSGP)**. NAVSTA Mayport has a Florida MSGP for Stormwater Discharges Associated with Industrial Activity, effective until 2011, which authorizes the discharge of stormwater associated with industrial activity (Sectors K, P, R, S, and T) to surface waters under NPDES. NAVSTA Mayport has prepared a Stormwater Pollution Prevention Plan (SWPPP) in accordance with the permit requirements for the identification and management of industrial activities at the installation.

- **Municipal Separate Storm Sewer Systems (MS4) Permit.** NAVSTA Mayport holds a General Permit for Discharge from Phase II MS4, effective through April 2013, which authorizes the discharge of stormwater from urbanized areas and construction activities (1-5 acres) to surface waters. The MS4 permit requires implementation of best management practices (BMPs), development schedules and measurable goals, establishment of a Stormwater Management Plan (SWMP), and submission of Annual Reports.

- **Construction Generic Permit (CGP).** Activities at NAVSTA Mayport that disturb greater than one acre of soil, including lay-down, ingress (entry) and egress (exit) areas, requires a CGP for Stormwater Discharge from Large and Small Construction Activities. A construction stormwater permit is separate from the MSGP for industrial stormwater. The requirements include a Notice of Intent, a Notice of Termination and a construction site SWPPP.

Environmental Resource Permits for Stormwater Management Systems. Environmental Resource Permit is required by the FDEP or the SJRWMD for construction, operation, maintenance, alteration, removal or abandonment of stormwater management systems. Additionally a permit is required for alterations which result in an increase in pollutant loading or peak discharge or in a decrease in detention storage. Applicable stormwater management systems include: dry detention systems, retention systems, underdrain systems, underground exfiltration systems, wet detention systems, and swale systems. NAVSTA Mayport has obtained approximately 34 individual Environmental Resource Permits from the SJRWMD for stormwater ponds.

Stormwater runoff from NAVSTA Mayport has three possible directions to drain: northerly to the turning basin and St. Johns River; southerly towards Lake Wonderwood and a marsh area; and westerly towards Chicopit Bay. Within these three general flow directions, NAVSTA Mayport has been divided into 61 drainage basins. Approximately 17 of the basins contain industrial activity as defined by the MSGP; however, ship maintenance (Sector R) may occur occasionally in several more basins along the piers. There are 43 direct discharges (“Outfalls”) either through drainage pipes or concentrated ditch flows. There are 19 drainage basins that either sheet flow to low points with no apparent outfall or sheet flow off-site with no concentrated discharge point. The majority of the outfalls (33) are to the Turning Basin, four occur along the southern edge of the Entrance Channel, four occur to the St. Johns River north of the runway, one occurs at the marsh area between the runway and Village of Mayport, and one to a creek in the marshlands south of the southwestern end of the runway (NAVFAC Southeast 2006).

3.11.6 Solid Waste Disposal

Solid waste is collected from all areas of NAVSTA Mayport (including residential and industrial areas) by Public Works Center Jacksonville Facility Management and Utilities contractor. Waste is collected and transferred to NAVSTA Mayport's FDEP-permitted on-Station Solid Waste Transfer Station, where it is sorted and reloaded for removal and disposal of at Trail Ridge Landfill (McVann 2007b, Mitchell 2007). This Class I landfill was opened in 1992 and is operated by Trail Ridge Landfill, Inc., located approximately 19 miles west of NAVSTA Mayport. Based on 2006 aerial topographic imagery, the facility has an estimated remaining capacity of 10,718,295 cubic yards and currently has a 14-year life expectancy (Hair 2007). As a Class I landfill, it can accept up to 5,000 tons of solid waste per day and averages between 1,800 and 1,900 tons per day (DoN 1997).

Berthing vessels use dumpsters located at selected pier locations for refuse disposal and recyclable product containers for metal. Dumpsters are serviced during weekdays only and recyclable product containers are emptied on an as needed basis.

3.12 ENVIRONMENTAL HEALTH AND SAFETY

The ROI for potentially contaminated sites includes identified sites located near the area of potential development. With regard to hazardous/toxic materials and waste disposal, the ROI is the waterfront operations area of NAVSTA Mayport but includes Station-wide policies for management of these materials and wastes. The ROI for safety encompasses NAVSTA Mayport and the off-shore areas in the St. Johns River that would be subject to dredging under the Group 2 and 3 alternatives. With regard to environmental justice and protection of children, the ROI is expanded to include the communities that border NAVSTA Mayport and would potentially be affected by environmental health and safety practices at NAVSTA Mayport.

3.12.1 Historical Overview of Project Site

As detailed in Section 3.7.2, NAVSTA Mayport has been used for various Navy activities since the 1930s. Wastes generated by past activities at NAVSTA Mayport include those normally associated with ship, on-shore maintenance, and flight operation activities. Wastes generated and disposed of at NAVSTA Mayport include waste oils, fuels, lubricants, solvents, paints, and general refuse associated with ship, aircraft, vehicle, and building maintenance activities. From 1942 to 1979, all wastes were disposed of in landfills on NAVSTA Mayport. Some of the landfilled wastes were burned onsite to reduce their volume. Additionally, some waste oils were used for mosquito control around NAVSTA Mayport. From 1979 to 1994, all burnable wastes were incinerated in a carbon containing fuel boiler. Incinerator ash, unburnable debris, construction rubble, and large scrap materials were landfilled on NAVSTA Mayport until early 1985 when all onsite landfills were closed (USEPA 1996).

3.12.2 Installation Restoration Program

The DoD established the Installation Restoration Program (IRP) in 1980 to identify, characterize, and remediate environmental contamination on military installations resulting from hazardous waste management practices. The IRP established a process to evaluate past hazardous waste management and disposal sites on DoD property to control the mitigation of contaminants and hazards to human health and the environment that may have resulted from past DoD operations and activities. NAVSTA Mayport manages its IRP in accordance with the Navy/Marine Corps Installation Restoration Manual, which represents a compilation of Defense Environmental Restoration Program requirements, policy, and guidance for both the U.S. Navy and U.S. Marine Corps and provides a synopsis of the laws and regulations that define and affect the IRP.

In addition, NAVSTA Mayport operates a Hazardous Wastes Storage Facility under the provisions of a Resource Conservation and Recovery Act/Hazardous and Solid Waste Amendments (RCRA/HSWA) permit (Number 72442-HO-003) that requires investigation into all potential sources of soil and groundwater contamination present at NAVSTA Mayport (Mitchell 2007). Potential sources include: sites identified as having been used to dump, store, or contain any solid or toxic wastes; sites of potential spills or leaks of hazardous liquids; and areas of known or suspected contamination identified under the IRP. These areas have been designated as Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs).

USEPA Region 4 conducted a RCRA Facility Assessment (RFA) at NAVSTA Mayport in 1989, and the RFA identified 56 SWMUs and two AOCs. Fifteen SWMUs were determined to require No Further Action; 18 SWMUs required RCRA Facility Investigations (RFIs) to be conducted; and 23 SWMUs required further action. In 1992, the Navy initiated the first phase of an RFI to determine the type and extent of contamination, establish criteria for cleanup, and identify and evaluate remedial action alternatives and costs. Subsequent preliminary assessments (PAs) and site inspections (SIs) were conducted to recommend sites for investigation and to confirm which areas were contaminated (DoN 1997).

The ROI for IRP sites encompasses the areas adjacent to and in the vicinity of the areas of proposed development. As shown in Figure 3.12-1, six of the SWMUs: 01, 23, 24, 25, 44, and 45 are located east of the area of potential development for the CVN propulsion plant maintenance facilities. In addition, four SWMUs are located relatively near the area of potential development for the proposed transportation

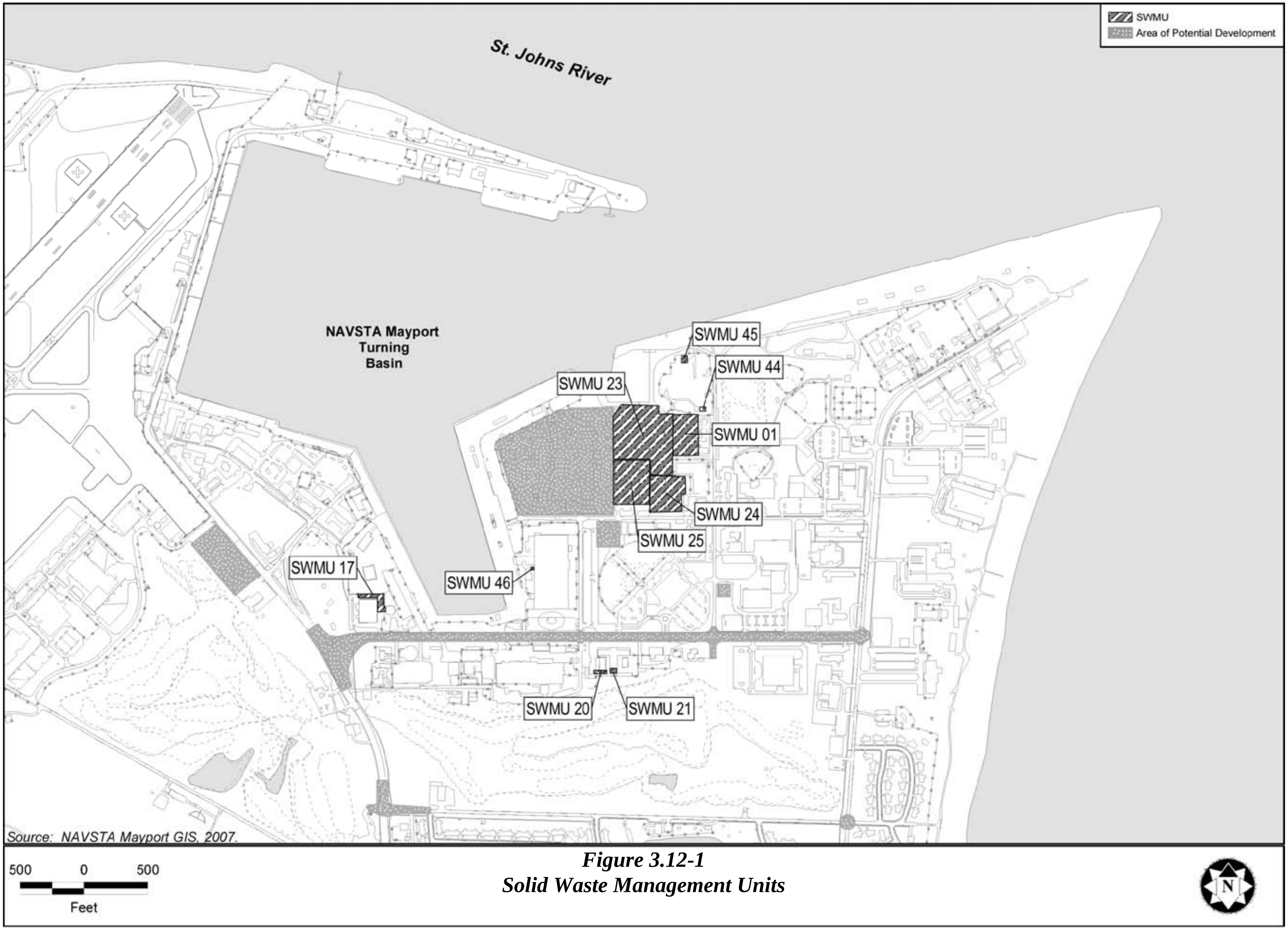


Figure 3.12-1
Solid Waste Management Units

improvements associated with Massey Avenue widening: SWMUs 17, 46, 20 and 21. The following paragraphs describe these SWMUs, actions taken to date, and current status of these sites.

3.12.2.1 SWMU 01 – Landfill A

This site, known as Landfill A, is a former landfill that was operated by the Navy from 1942 to 1960 and is located approximately 500 ft east of the area of potential development for the CVN propulsion plant maintenance on-shore facilities and approximately 1,000 ft north of the area of potential development for the headquarters facilities (see Figure 3.12-1). Concentrations of PCBs and three metals were reported in the 1995 RFI as exceeding residential clean up levels for surface soil. In addition, arsenic was identified in subsurface soils at concentrations exceeding residential cleanup levels. None of these (surface or subsurface) contaminants was found to be present at a concentration exceeding industrial cleanup levels. A subsequent Corrective Measure Study (CMS) and addendum to the CMS were conducted, and the results were submitted to USEPA in January 2007. The CMS Addendum reported that arsenic and five PAHs were identified at concentrations that exceeded the residential cleanup criteria in surface soil; however, none exceeded the residential cleanup criteria in subsurface soil. As was the case with the original data, concentrations of contaminants identified did not exceed industrial cleanup levels.

Groundwater at the site has been investigated as part of the evaluation of surrounding SWMUs because of proximity, similarities in subsurface conditions, and like contaminants. Groundwater constituents exceeding residential cleanup criteria include only metals (antimony, arsenic, silver, and zinc). Groundwater in the area generally flows north towards the St. Johns River, which indicates that SWMU 01 is located cross-gradient from the proposed development site with respect to groundwater flow. Land Use Controls (LUCs) restricting the use of SWMU 01 to industrial use only were recommended the conclusion of the CMS Addendum for both soil and groundwater. Furthermore, groundwater is currently being monitored on a quarterly basis (TetraTech NUS 2007).

3.12.2.2 SWMU 23 – Jacksonville Shipyards, Inc.

This site, a former (1961 to 1992) contractor-operated shipyard, is located approximately 250 ft from the eastern edge of the proposed area of development for CVN propulsion plant maintenance facilities (see Figure 3.12-1). An RFI completed in 1996 indicated surface soil and subsurface soil were impacted by operations at the site. Approximately 400 tons of soil was removed from SWMU 23 as part of an Interim Measure prior to the CMS Addendum completed in 2007. The CMS Addendum reported that four metals (arsenic, copper, lead, and nickel) and seven PAHs were found to be present at concentrations exceeding the residential cleanup criteria in surface soil, and arsenic was identified at concentrations exceeding residential clean up criteria in subsurface soil. Concentrations identified in surface and subsurface soil did not exceed industrial cleanup levels.

As with SWMU 01, groundwater at the site has been investigated as part of the surrounding SWMUs because of proximity, similarities in subsurface conditions, and like contaminants. Groundwater contaminants exceeding residential cleanup criteria at SWMU 23 include only metals (antimony, arsenic, silver, and zinc). Groundwater in the area generally flows north towards the St. Johns River, which indicates that SWMU 23 is located cross-gradient from the proposed development site with respect to groundwater flow.

As with SWMU 01, LUCs restricting the use of SWMU 23 to industrial use only were recommended in the conclusion of the CMS addendum for both soil and groundwater. Furthermore, groundwater is currently being monitored on a quarterly basis (TetraTech NUS 2007).

3.12.2.3 SWMU 24 – North Florida Shipyards, Inc.

This site, an active contractor-operated shipyard, is located approximately 500 ft from the southeastern edge of the area of proposed development for CVN propulsion plant maintenance facilities and 700 ft from the northwestern edge of the proposed headquarters facility site (see Figure 3.12-1). An RFI indicated surface soil and subsurface soil were impacted by operations at the site. Approximately 918 tons of soil was removed from SWMU 24 as part of an Interim Measure prior to the CMS Addendum completed in 2007.

The CMS Addendum reported seven PAHs present at concentrations exceeding the residential cleanup criteria in surface soil and arsenic exceeding residential clean up criteria in subsurface soil. Concentrations in surface and subsurface soil did not exceed industrial cleanup levels.

As with SWMUs 01 and 23, groundwater at the site has been investigated as part of the surrounding SWMUs because of close proximity, like subsurface conditions, and like contaminants. Groundwater constituents exceeding residential cleanup criteria include only metals (antimony, arsenic, silver, and zinc). Groundwater in the area generally flows north towards the St. Johns River, which indicates that SWMU 24 is located cross-gradient from the proposed development site with respect to groundwater flow.

As with SWMUs 01 and 23, LUCs restricting the use of SWMU 24 to industrial use only were recommended in the conclusion of the CMS addendum for both soil and groundwater. Furthermore, groundwater is currently being monitored on a quarterly basis (TetraTech NUS 2007).

3.12.2.4 SWMU 25 – Atlantic Marine, Inc.

This site, an active contractor-operated shipyard, is located approximately 200 ft east of the southeastern edge of the area of proposed development for CVN propulsion plant maintenance facilities and 800 ft northwest of the proposed headquarters facility site (see Figure 3.12-1). An RFI completed in 1996 indicated surface soil and subsurface soil were impacted by operations at the site.

The CMS Addendum reported that pesticide contaminants dieldrin and aldrin were present at concentrations exceeding the residential cleanup criteria in surface and subsurface soil. Concentrations in surface and subsurface soil did not exceed industrial cleanup levels. Approximately 14 tons of soil was removed during a Remedial Action completed in February 2007, and the site was capped with asphalt as part of the action (TN & Associates, 2007).

As with SWMUs 01, 23 and 24, groundwater at the site has been investigated as part of the surrounding SWMUs because of proximity, similarity in subsurface conditions, and like contaminants. Groundwater constituents exceeding residential cleanup criteria include only metals (antimony, arsenic, silver, and zinc). Groundwater in the area generally flows north towards the St. Johns River, which indicates that SWMU 25 is located cross-gradient from the proposed development site with respect to groundwater flow.

LUCs restricting the use of SWMU 25 to industrial use only were recommended in the conclusion of the CMS addendum for both soil and groundwater and still apply even after the remedial action described above. Groundwater, as with the other SWMUs described above, is currently being monitored on a quarterly basis (TetraTech NUS 2007).

3.12.2.5 SWMU 44 – Wastewater Treatment Plant, Former Primary Clarifiers, and SWMU 45 – Sludge Drying Beds

These two sites are located approximately 500 ft east and northeast, respectively, from the northeast corner of the area of proposed development for CVN propulsion plant maintenance facilities (see Figure 3.12-1) and upgradient with respect to the direction of groundwater flow. As part of the RFI, the Former Primary Clarifiers and Sludge Drying Beds associated with the wastewater treatment facility were identified as SWMUs. The clarifiers and drying beds were removed in 2003. The sludge material was analyzed and characterized as non-hazardous. The sludge and all structures associated with the clarifiers and drying beds were removed and disposed off site. Currently, SWMUs 44 and 45 are subject to LUCs restricting development to industrial use based on soil characteristics.

3.12.2.6 SWMU 46 – Shoreline Intermediate Maintenance Activity Engine Drain Sump

This site is located approximately 150 ft south of the southern edge of the proposed development area for CVN propulsion plant maintenance facilities and approximately 500 ft north of the northern edge of the area of potential development associated with the Massey Road widening east of Building 1488 (SERMC) (see Figure 3.12-1). The site is upgradient from the area of proposed development with respect to the direction of groundwater flow.

The site was initially investigated as a SWMU with respect to petroleum contaminants identified in the soil. The site was approved for No Further Action prior to 1993 but was reevaluated in 1995 when the site was transferred from the Restoration Program to the Petroleum Program. On 10 June 2000, the FDEP granted No Further Action status with no LUCs to SWMU 46 (Racine 2007a).

3.12.2.7 SWMU 17 – Carbonaceous Fuel Boiler Area

This site is located approximately 125 ft north of the northern edge of the area of potential development associated with the Massey Road widening near the intersection with Maine Street (see Figure 3.12-1). The Carbonaceous Fuel Boiler was a furnace fueled by domestic solid waste from both the NAVSTA Mayport fleet and the housing area within the installation. The boiler also burned waste oil collected from various locations within NAVSTA Mayport as well as oil recovered from bilge water by the oily waste treatment plant. Waste oil and diesel fuel were stored at the boiler area in two 6,000 gallon underground storage tanks (USTs) and two 550 gallon USTs, respectively. The boiler was operated 24 hours a day from 1979 to mid-1994, at which time it was taken out of service (NAVSTA Mayport 2007c).

The RFA identified the boiler area as a SWMU because fly ash was being stored on the northern side of the boiler building, and a small amount of ash was noted to be piled on the asphalt near a roll-off container. The fly ash exceeded the federal regulatory criteria for lead and cadmium. From March through October 1995, an RFI was conducted to delineate the nature and extent of contamination (NAVSTA Mayport 2007c).

After the RFI was completed, an interim measure consisting of LUCs was implemented to restrict the SWMU to non-residential use. To date, the proposed corrective action for SWMU 17 is LUC implementation and maintenance for surface soil. The surface soil around SWMU 17 has been impacted by low concentrations of benzo(a)pyrene that exceed the FDEP's soil cleanup target levels for direct residential exposure. Recent groundwater sampling has shown that groundwater contamination is not a concern at this site. LUCs will be implemented in the form of residential use and soil disturbance restrictions (NAVSTA Mayport 2007c).

3.12.2.8 SWMU 20 and 21 – Hobby Shop Drain and Hobby Shop Scrap Storage Area

This site is located approximately 225 ft south of the southern edge of the area of potential development associated with the Massey Road widening southwest of Building 414 (MWR Offices) (see Figure 3.12-1). The facility contained scrap metal, engine parts, open gas cylinders and a Freon 22™ container, an automotive battery, old appliances, and other scrap metal items that were ultimately collected by the Defense Reutilization and Marketing Office for resale. The drain was located on the soil adjacent to a sloped concrete apron leading to the raised concrete floor of Building 1965. The approximately 20 sf Hobby Shop Scrap Storage Area was located adjacent to the south side of the east wing of Building 414, and surrounded by fencing with an entrance gate on the south side (NAVSTA Mayport 2007c).

Limited confirmatory sampling was conducted by ABB Environmental Services in May 1995 as part of the RCRA Facility Assessment – Visual Site Inspection at SWMUs 20 and 21. Field activities included the collection of eight surface and six subsurface soil samples and the installation and sampling of six shallow groundwater monitoring wells. According to the CMS of June 2007, no surface soil, subsurface soil, or groundwater contaminants of concern were identified for SWMUs 20 and 21. Therefore, no actions were recommended (NAVSTA Mayport 2007c).

3.12.3 Hazardous/Toxic Materials and Waste Disposal

A hazardous substance is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either on its own or through interaction with other factors. The terms “hazardous material,” “toxic substance,” and “hazardous waste” are used in this section, first to emphasize that they are all hazardous substances that may present a substantial threat to public health, welfare, and the environment; and second, to define the terms in reference to their unique applications under specific federal regulations.

Hazardous substances are defined and regulated in the U.S. primarily by laws and regulations administered by the U.S. Occupational Safety and Health Administration (OSHA), USEPA, and U.S. Department of Transportation (DOT). Each agency incorporates hazardous substance terminology in accordance with its unique Congressional mandate. Therefore, OSHA regulations categorize substances in terms of their impacts on employee and workplace health and safety, DOT regulations in terms of safety in transportation, and USEPA regulations in terms of protection of environment and public health.

In terms of their environmental impacts, hazardous materials, toxic substances, and hazardous wastes are regulated under federal programs administered by USEPA, including the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA), Toxic Substances Control Act (TSCA), and RCRA. DoD installations are required to comply with these laws and all other applicable federal, state and DoD regulations, as well as 40 CFR 112 and EO 13423 (24 January 2007).

The OSHA Hazard Communication regulation (29 CFR 1910.1200) defines a hazardous chemical as any chemical which is a physical or health hazard. The definition includes chemicals which are carcinogens (a cancer causing substance or agent), toxins, toxic agents, irritants, corrosives, and sensitizers; agents which act on the hematopoietic system (affect the formation of blood); agents which damage the lungs, skin, eyes, or mucous membranes; chemicals which are combustible, explosive, flammable, unstable (reactive), or water-reactive; oxidizers; pyrophorics (capable of spontaneous combustion); and chemicals which in the course of normal handling, use, or storage may produce or release dusts, gasses, fumes, vapors, mists, or smoke that may have any of the previously mentioned characteristics. Currently, OSHA regulates workplace exposure to approximately 400 substances, including dusts, mixtures, and common materials such as paints, fuels, and solvents (DoN 2006c).

In CERCLA Section 101(14), USEPA defines the term “hazardous substance” by reference to provisions in other environmental statutes that identify substances as hazardous (e.g., the OSHA definition as described above). USEPA’s definition includes any item or chemical which can cause harm to people, plants, or animals when released by spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment and any substance for which a reportable quantity is established in 40 CFR 302.4.

The DOT hazardous materials Regulations (49 CFR 171) define a hazardous materials as a substance or material that has been determined to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. The DOT definition of “hazardous material” includes hazardous substances, hazardous wastes, and marine pollutants.

The promulgation of TSCA represented an effort by the federal government to address those chemical substances and mixtures for which it was recognized that the manufacture, processing, distribution, use, or disposal may present an unreasonable risk of injury to health or the environment, and to effectively regulate these substances and mixtures in interstate commerce. Toxic chemical substances regulated by

USEPA under TSCA include asbestos, lead, and PCBs, was well as more than 62,000 chemicals and substances on TSCA Chemical Substances Inventory lists.

In regulations promulgated under RCRA, USEPA defines hazardous waste as a solid waste which is not excluded from regulation as a hazardous waste under 40 CFR 261.4(b) and exhibits any of the characteristics (ignitability, corrosivity, reactivity, toxicity) described in 40 CFR 261; or is listed in 40 CFR 261 Subpart D; or is a mixture containing one or more listed hazardous wastes. Hazardous Waste may take the form of solid, liquid, contained gaseous, or semi-solid wastes (e.g., sludges), or any combination of wastes, that pose a substantial present or potential hazard to human health or the environment and have been discarded or abandoned. Military munitions used for their intended purposes on ranges, or collected for further evaluation, such as recycling, are not considered waste per the Military Munitions Rule (40 CFR 266.202).

3.12.3.1 Hazardous Materials

Routine operations on NAVSTA Mayport require use of a variety of hazardous materials, including petroleum, oil, and lubricant (POL) products, solvents, cleaning agents, paints, adhesives, and other products necessary to perform ship, ground vehicle, and equipment maintenance, military training activities, facilities repair and maintenance, and administrative and housing functions.

Bulk quantities of fuels (e.g., heating oil, JP-5, gasoline, diesel) and other POLs (products and wastes) are managed in aboveground storage tanks (ASTs) and USTs, pumps, pipelines, and oil/water separators across NAVSTA Mayport, and these storage locations and facilities represent potential sources of small spills. Emergency generators are typically supplied with diesel fuel stored in tanks. The ASTs and USTs and associated systems and operations at NAVSTA Mayport are managed in accordance with federal and state regulations and the NAVSTA Mayport SPCC Plan (NAVSTA Mayport 2002).

The ashore activities at NAVSTA Mayport manage hazardous materials in accordance with NAVSTAMYPTINST 4100.2, Hazardous Materials Minimization Reissue Management Program. NAVSTA Mayport operates a Hazardous Materials Minimization Center, which serves as the central distribution facility for hazardous materials. Units and activities that require hazardous materials in their operations are limited to purchasing only those hazardous materials appearing on their specific authorized use list. Ships berthing at NAVSTA Mayport manage hazardous materials in accordance with OPNAVINST 5100.28, Hazardous Materials User's Guide, which provides guidelines to assist afloat personnel who are hazardous materials users in protecting themselves and the environment. The information in this guide is intended to be used as a supplement to data and instructions contained in the Material Safety Data Sheet (MSDS) for specific chemical products.

3.12.3.2 Toxic Substances

Toxic substances commonly occurring on Navy Installations include asbestos, lead-based paint (LBP), and PCBs.

Asbestos. Asbestos is the name of a group of naturally occurring minerals that separate into strong, very fine fibers, which are heat-resistant and extremely durable. Asbestos has been used in a variety of forms for insulation (thermal and acoustical) and decorative purposes, and it is typically found on boilers, pipes, and in many other appliances and construction materials, for example, in plastics, sealers and adhesives, where it was used to add strength, and in concrete structures.

Asbestos becomes a health hazard when its microscopic-sized fibers are released into the air. This can happen when asbestos-containing material is disturbed, and once emitted to the atmosphere, these fibers can remain suspended in the air for long periods of time. When inhaled, asbestos fibers can easily lodge in body tissues, especially the lungs. Inhalation of asbestos fibers is known to cause asbestosis, a chronic disease of the lungs which makes breathing progressively more difficult; and mesothelioma, a cancer of the chest and abdominal membranes. Other cancers, primarily of the digestive tract and lungs, have also been associated with exposure to asbestos. Many other fibrous materials (e.g., fiberglass, mineral wool) have been used over the years as substitutes for asbestos, and it is not possible to reliably distinguish asbestos fibers from nonasbestos fibers with the naked eye.

The Navy policy with regard to asbestos states that only non-asbestos materials will be used during construction, overhaul, and repair and maintenance of shore facilities and Navy ships when suitable substitutes exist; and that the Navy will identify suitable asbestos-free substitute materials for asbestos materials still in use.

NAVSTA Mayport manages asbestos in shore facilities and asbestos waste in accordance with CNIC Instruction 5100.1, Asbestos Management Program. NAVSTA Mayport shore facilities scheduled for maintenance, renovation, remodeling or demolition are inspected for the presence of asbestos containing material (ACM), as required by law or as a precautionary measure when ACM is to be removed through outside contracts by licensed specialized firms. On an infrequent basis, ACM is removed from ships and received by NAVSTA Mayport for disposal. Removed ACM and ACM received from ships are transported offsite by appropriately licensed transporters and disposed in appropriately permitted landfill facilities in accordance with applicable federal, state, local, and DoD regulations.

LBP. Exposure to lead is associated with adverse health effects, including permanent damage to the central nervous system. In the past, white lead pigments were used to make durable paint products, and red lead pigments were used in primers to inhibit corrosion when applied to metal surfaces. Lead exposure can result from the ingestion of paint chips or dust from deteriorating paints or from improper paint removal. Young children are at greatest risk from this exposure.

DoD policy with regard to LBP is to manage LBP in a manner protective of human health and the environment and to comply within applicable federal, state, and local laws and regulations governing LBP hazards. Painted surfaces can be tested to determine if LBP is present.

NAVSTA Mayport manages LBP in accordance with OPNAVINST 5100.23F (DoN 2002a). To ensure that DoD employees engaged in the maintenance and repair of surfaces with LBP, local work procedures are implemented to minimize personal exposure to lead (for the employees to themselves, as well as for other occupants of the facility), and to minimize risk of environmental contamination. Employees and contractors involved in maintenance and repair activities that could result in exposure to LBP attend annual training to reinforce their knowledge of engineering controls to reduce risk of exposure to lead during work activities.

PCBs. PCBs are highly stable organic chemical compounds with a low flammability (i.e., they do not readily burn), high heat capacity, and low electrical conductivity; therefore, in the past they were extensively used as a component of many materials, most notably as heat insulating materials (e.g., hydraulic fluid in vehicles, lifts, elevators) and as dielectric (nonconducting) fluids in electrical transformers, capacitors, and ballasts. The harmful effects of PCBs to humans and the environment were not well documented in the past; however, PCBs are now known to cause skin irritation and cancer and to persist in the environment (i.e., they do not easily break down and they tend to accumulate in the tissues of living organisms). Under the authority of TSCA, the USEPA banned the continued manufacture of PCBs after 1978. In addition, the agency imposed controls related to existing PCB-containing electrical equipment that remain in use or that are removed from service for reuse or disposal. PCBs have been identified as a contaminant in soils at two NAVSTA Mayport IRP sites, but no PCB-containing equipment exists at NAVSTA Mayport following a comprehensive electrical equipment sampling and removal program conducted in the 1990s.

3.12.3.3 Hazardous Waste

NAVSTA Mayport is classified as a Large Quantity Generator of hazardous waste (USEPA Identification No. FL9170024260) and, therefore, is subject to full regulation under RCRA, including requirements for testing, storage, and management of hazardous waste, as well as manifest preparation and proper disposal off-site. Hazardous wastes generated at NAVSTA Mayport are accumulated in satellite locations and less than 90-days sites and transferred to the Hazardous Waste Storage Facility (HWSF) for disposal. The HWSF is operated under a RCRA/HSWA permit (Number 72442-HO-003) and has a storage capacity of 460 55-gallon drums of hazardous waste and generally operates at approximately 35 percent of its capacity (DoN 1997).

Hazardous wastes are managed in accordance with SOPA(ADMIN)MYPTINST5090.1F, *Disposal of Hazardous Materials/Hazardous Wastes*, dated 10 May 2004. The NAVSTA Mayport, Public Works Department, Environmental Division is responsible for implementing this instruction. In accordance with the instruction, activities must reduce hazardous waste generation by implementing the following, listed in order of priority:

1) Eliminate and/or reduce the use of hazardous material at the source by changing the process, requirement, or materials used;

2) Substitute a less hazardous/toxic hazardous materials;

3) Reduce and/or eliminate hazardous waste by process or equipment changes;

4) Recycle/recover and reuse hazardous materials whenever possible;

5) Reduce/eliminate excess and expired-shelf life hazardous materials; and

6) Improve housekeeping in the hazardous waste generating process.

Disposal of hazardous waste is considered a last resort, and the long-term goal is to eliminate hazardous waste to the maximum extent possible by eliminating the use of hazardous materials or by implementing best management practices and best available technologies. Tenants may develop local procedures for hazardous waste management, and SERMC, for example, has implemented Local Standard Item No. 099-59SE, Hazardous Waste Produced on Naval Vessels for ship repair contractors. The Defense Reutilization and Marketing Service (DRMS) arranges for offsite disposal of hazardous waste generated at NAVSTA Mayport.

Navy policy, which was developed with agreement from regulatory agencies, established that ships are not hazardous waste generators; and that ships generate Used Hazardous Material (UHM). This material is not considered a hazardous waste until the receiving shore activity declares it waste and subjects it to regulations. This policy applies for afloat commands only for material generated shipboard by ship's forces. When UHM is offloaded and determined by the Shore activity to have no further use, the UHM becomes regulated waste and is subject to all applicable regulations. Prior to off loading any type of hazardous materials, ships are required to provide funding to pay for disposal costs. The NAVSTA Mayport Environmental Division supports fleet commands in managing UHM and provides appropriate containers (e.g., drums) for transfer and storage of UHM upon request.

3.12.4 Safety

Safety concerns include current NAVSTA Mayport activities, land conditions, and policies and procedures that affect, or have the potential to affect, military or civilian populations. These concerns vary widely by area, depending on the nature of both past and current use of the land and structures, and are also influenced by the level of human activity on and near NAVSTA Mayport. This section addresses public safety, occupational/workplace safety, and navigational safety aspects associated with construction and dredging, which include shore-based activities within NAVSTA Mayport and afloat and underwater activities within the NAVSTA Mayport turning basin and entrance channel.

Public access to NAVSTA Mayport is restricted for the safety of visitors and NAVSTA Mayport personnel, and access is controlled by limiting entry to only authorized personnel and through the use of fencing, barriers, and signs. NAVSTA Mayport maintains a high level of security in accordance with Navy and DoD policies and procedures, which are required to reduce the vulnerability to known or anticipated terrorist or other criminal attacks, and which are implemented in accordance with the THREATCON system (see Section 3.2.3). Construction and dredging activities conducted by Navy and contractor personnel are governed by regulations established under the Navy Safety and Occupational Health Program (NAVOSH) and OSHA, respectively. NAVSTA Mayport implements the Navy Safety and Occupational Health Program in accordance with OPNAVINST 5100.8G.

With regard to proposed dredging activities, navigational safety is a primary concern. NAVSTA Mayport is subject to U.S. Coast Guard regulations promulgated under 33 CFR, specifically those applicable to inland waters. The Amelia Island to St. Augustine nautical chart includes a danger area located from the eastern tip of the jetties at the mouth of the St. Johns River to approximately 5 nm offshore (including Jacksonville Harbor Bar Cut 3 Area 1). This danger area is open to unrestricted surface navigation but all vessels are cautioned neither to anchor, dredge, trawl, lay cables, bottom nor conduct any other similar type of operation because of residual danger from mines on the bottom (NOAA 2005).

The NAVSTA Mayport turning basin is subject to storm surges and is not considered a hurricane haven because the surrounding low topography does not provide an adequate windbreak. Storm tides are more frequent than destructive winds and, along the coast, are the major threat to shipping and residents. Storm surges vary significantly over short distances. Maximum heights occur along the beaches and the entrance jetties, then decrease rapidly up the St. Johns River (NOAA 2006).

3.12.5 Environmental Justice/Protection of Children

Environmental justice is a regulatory objective pertaining to the proportional distribution of adverse environmental effects that would be experienced by minority communities and low-income socioeconomic groups. In particular, environmental justice is achieved if low-income and minority communities are not subjected to disproportionately high or adverse environmental effects.

Populations potentially affected by environmental consequences are those that are at NAVSTA Mayport or immediately adjacent to NAVSTA Mayport. Because the U.S. Census Bureau uses census tracts as relatively permanent statistical subdivisions for the purpose of presenting data, the ROI for environmental justice was defined as those census tracts including and bordering the developed portion of the main portion of the installation. These census tracts include 138, 139.01, 139.03, 139.04 and 101.03. The total population for this five census tract ROI in 2000 was 28,879 or 3.7 percent of Duval County’s 778,879 2000 population.

This section focuses on the distribution of race and poverty status in the area potentially affected by implementation of the action alternatives. The comparison population, or the baseline demographic for comparison to be used in the analysis of disproportionate impacts is defined as Duval County (see Section 4.13 for impact analysis). Duval County encompasses the area where social and environmental justice conditions could potentially be influenced as a result of the proposed project. For purposes of this analysis, minority populations and low-income populations were defined as follows:

- A minority is defined as persons of Hispanic or Latino origin of any race; African Americans, American Indian/Alaska Native; and Asian or Pacific Islanders (without double-counting persons of Hispanic/Latino origin who are also contained in the racial categories).
- Minority populations are identified where either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully

greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997).

- Low-income populations are defined as areas where a greater percentage of persons are living below the poverty level than in the comparison population. The U.S. Census Bureau uses a set of 48 money income thresholds to define the poverty threshold, for a family of four the poverty threshold in 2000 was $17,463 (U.S. Census Bureau 2007a).

Minority Populations – In the 2000 census, 28,040 persons within the ROI reported race and an additional 1,864 reported on ethnic origin. Of these, 7,433 (26.5 percent) were minorities. As shown in Table 3.12-1, those of Black or African American race were most predominant, accounting for 13.9 percent of the population. A higher percentage of minorities reside in Duval County than in the ROI. Of those who reported racial or ethnic origin within Duval County (the comparison area), 38.2 percent were minorities. In terms of ethnicity, the proportion of Hispanic or Latino residents within the ROI (6.4 percent) is higher than within Duval County (4.0 percent). Among census tracts in the ROI itself, the least number of minorities were reported within census tract number 101.03 (6.1 percent), which is located directly north of NAVSTA Mayport. As shown in Table 3.12-3, the minority population in two census tracts: 138 (the area containing NAVSTA Mayport) and 139.01 (the area southwest of NAVSTA Mayport) exceeds the Duval County comparison area minority population by 4 percentage points and 1.3 percent points, respectively. No portion of the study area exceeds the 50 percent minority threshold.

Low-Income Populations – In 2000, 25,704 reported on income level within the ROI. Of these individuals 1,978 persons (7.6 percent) were living below the poverty threshold. Duval County, the comparison area, has a poverty rate of 11.9 percent. As show in Tables 3.12-2 and 3.12-3, census tract 139.04, which is directly south of NAVSTA Mayport, has the highest poverty rate within the ROI and has a greater rate than the comparison area. Census tract 138, which includes NAVSTA Mayport, has a poverty rate of 7.4 percent.

Protection of Children. EO 13045, Environmental Health Risks and Safety Risks to Children, which was signed by President Clinton on 21 April 1997, states:

> A growing body of scientific knowledge demonstrates that children may suffer disproportionately more environmental health risks and safety risks. These risks arise because: children's neurological, immunological, digestive, and other bodily systems are still developing; children eat more food, drink more fluids, and breathe more air in proportion to their body weight than adults; children's size and weight may diminish their protection from standard safety features; and children's behavior patterns may make them more susceptible to accidents because they are less able to protect themselves. Therefore,

the extent permitted by law and appropriate, and consistent with the agency's mission, each federal agency:

(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and

(b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks and safety risks.

Under the definitions provided in EO 13045, covered regulatory actions include those that may be "economically significant" (under EO 12866) and "concern an environmental health risk and safety risk that an agency has reason to believe may disproportionately affect children." Further, EO 13045 defines environmental health risks and safety risks as "risks to health or to safety that are attributable to products or substances that the child is likely to come in contact with or ingest (such as the air we breath, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)."

Within NAVSTA Mayport, there is one Child Development Center (Building 373). This building is located south of Moale Avenue approximately 2,750 ft south of the area of potential development for the CVN nuclear propulsion plant maintenance facilities and approximately 1,500 ft from the intersections of Moale Avenue/Maine Street and Moale Avenue/Baltimore Street.

Table 3.12-1 Race and Ethnicity (2000)

Geographic Area	White		Black or African American		American Indian and Alaska Native		Asian, Native Hawaiian, and Other Pacific Islanders		Some Other Race		Hispanic or Latino (of any race) [1, 2]	
	Number	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
United States	211,353,725	75.1	34,361,740	12.2	2,447,989	0.8	10,550,602	3.7	22,707,850	8.0	35,238,841	12.5
Duval County	512,659	65.8	216,517	27.7	2,995	0.3	21,061	2.7	25,647	3.2	31,809	4.0
ROI by Census Tract												
101.03	2,940	94.9	58	1.8	0	0.0	35	1.1	65	2.0	52	1.6
138	3,351	61.4	1,302	23.8	56	1.0	185	3.3	561	10.2	644	11.8
139.01	3,391	63.5	1,226	22.9	34	0.6	128	2.3	559	10.4	449	8.4
139.03	8,530	94.6	236	2.6	17	0.1	138	1.5	88	0.9	231	2.5
139.04	4,100	68.5	1,194	19.9	50	0.8	245	4.0	393	6.5	488	8.1
Total for five Census Tracts	**22,312**	**77.2**	**4,016**	**13.9**	**157**	**0.5**	**731**	**2.5**	**1,666**	**5.7**	**1,864**	**6.4**

Note: [1] The Hispanic population is not a racial category and includes components in each of the five racial categories (i.e., Hispanic figures cannot be added to racial categories to reach total population figure; double counting would result).

[2] Race statistics presented in this table will not add to 100 percent for two reasons: 1) a small percentage of the population reported two or more races, and 2) Hispanic or Latino origin statistics represent ethnicity (not race) and include all persons who identify themselves as of Hispanic or Latino origin or decent.

Source: U.S. Census Bureau 2007j.

Table 3.12-2 Poverty Based on Census 2000 Data

Geographic Area	Number of Persons Below Poverty Level*	Percent of Persons Below Poverty
United States	33,899,812	12.3
Duval County	90,828	11.9
ROI by Census Tract		
101.03	239	7.7
138	184	7.4
139.01	294	5.5
139.03	508	5.7
139.04	753	12.6
Total for five Census Tracts	**1,978**	**7.6**

*Note * The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is poor. If a family's total income is less than that family's threshold, then that family, and every individual in it, is considered poor. A summary of the 48 thresholds provides a general sense of the poverty threshold, but is not used to compute poverty data. The poverty thresholds do not vary geographically, but they are updated annually for inflation with the Consumer Price Index. Based on this information, the poverty threshold for a family of four in 2000 having two children under the age of 18 was $17,463 (U.S. Census Bureau 2007a).*
Source: U.S. Census Bureau 2007b, 2007c, and 2007d.

Table 3.12-3 Minority and Low-Income Populations Within the ROI

Census Tract	Total Percent Minority*	Minority Population >38.2 Percent	Poverty Rate (among individuals)	Low-income Population >11.9 Percent
101.03	6.1	No	7.7	No
138	42.2	Yes	7.4	No
139.01	39.5	Yes	5.5	No
139.03	7.6	No	5.7	No
139.04	35.7	No	12.6	Yes

*Note * The total minority population includes individuals of Hispanic/Latino origin, but those that are also Black/African Americans, American Indian/Alaska Natives, Asian, and Native Hawaiian/Other Pacific Islanders are not included in the total in order to avoid double counting.*
Source: U.S. Census Bureau 2007b.

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CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences of implementing the proposed action and alternatives. The 12 action alternatives evaluated include a wide range of scenarios for ship classes and combinations of classes. To discuss all 12 alternatives and the impacts individually would be a lengthy and repetitive process. The alternatives have therefore been separated into three groups based on fundamental components common to all the alternatives in each group. Environmental consequences that are common to each group of alternatives are discussed together whenever possible. When necessary, environmental consequences that are specific to individual alternatives are highlighted. The environmental consequences are discussed by groups as follows:

- Group 1 – Alternatives Involving Homeporting of Surface Ships (Non-CVN) include:
  - Alternative 1: CRU/DES Homeporting
  - Alternative 2: LHD Homeporting
  - Alternative 5: ARG Homeporting
  - Alternative 6: CRU/DES Homeporting and LHD Homeporting
- Group 2 – Alternatives Involving Dredging for Unrestricted CVN Capability include:
  - Alternative 3: CVN Capable
  - Alternative 7: CRU/DES Homeporting and CVN Capable
  - Alternative 9: LHD Homeporting and CVN Capable
  - Alternative 11: CRU/DES Homeporting and LHD Homeporting and CVN Capable
- Group 3 – Alternatives Involving Homeporting of a CVN include:
  - Alternative 4: CVN Homeporting
  - Alternative 8: CRU/DES Homeporting and CVN Homeporting
  - Alternative 10: LHD Homeporting and CVN Homeporting
  - Alternative 12: CRU/DES Homeporting and LHD Homeporting and CVN Homeporting.

In addition, the No Action Alternative (Alternative 13) is discussed separately from the three groups of action alternatives.

4.1 EARTH RESOURCES

Factors considered in evaluating impacts to earth resources included the following:

- Geological impacts: geological conditions that could result in structural damage on- or off-site (e.g., inadequate foundation, sinkhole formation, etc.).
- Soil and topography impacts: erosion resulting in an appreciable loss of topsoil.
- Marine sediment (including benthos) impacts: long term, irreversible consequences from proposed dredging activities.
- Jacksonville and Fernandina ODMDS capacity impacts: project and associated foreseeable future maintenance disposal materials estimates, capacity, and potential for expansion of these sites or establishment of a new ODMDS.

4.1.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

Alternatives 1 and 6 propose constructing a new DESRON headquarters building and Alternative 5 a new PHIBRON headquarters. Construction at the site of these facilities would disturb an estimated 0.50 acre. Soils at the proposed construction sites are previously disturbed and have already been compacted for development. Earth moving activities associated with construction would have localized impacts to arent and urban land soils present. During the construction phase, management control measures (e.g. temporary gravel construction entrance, straw bale/brush barriers, silt fencing, storm drain inlet protection, temporary stormwater diversion, sediment traps/basins, etc.) would be implemented within the area of potential development to address erosion and sedimentation and ensure that sediment is not transported off the construction site. Because the site of disturbance would be less than one acre, a Construction Generic Permit would not be required. However, an Environmental Resource Permit for Stormwater Management Systems would be required for total combined additional impervious surface area associated with the proposed development greater than 9,000 sf. Based on current facility design, the proposed facility size, along with associated parking and sidewalks, would exceed the 9,000 sf threshold for the Environmental Resource Permit for the PHIBRON headquarters facility and the DESRON headquarters facility (40C-42.022 FAC). The amount of impervious surface associated with the development, however, would be dependent on the ultimate site and facility design layout and specifications (e.g., single-story or multi-story structure). The construction contractor would be required to adhere with state water quality standards, including erosion and sediment control specified in the

Environmental Resource Permit for Stormwater Management Systems (if required). Due to erosion and sedimentation control measures, accelerated erosion would not occur and there would be no significant impacts from construction. In the long term, stormwater runoff would be controlled through construction of stormwater control structures as described in Section 4.11.1 which could result in localized changes to topography at the site of the DESRON/PHIBRON headquarters building. Long-term erosion impacts would be reduced to a level that would be the same or better than the existing condition by incorporating these permanent stormwater control features into the design as well as installing landscaping to provide land cover on permeable surfaces (See also Sections 4.3.1.2 and 4.11.1.5.). There would be no impact to soil resources with Alternative 2; no construction would occur under this alternative. No geologic impacts would occur with this group of alternatives.

No dredging would occur under Group 1 alternatives, therefore there would be no direct or indirect impacts to marine sediments in the NAVSTA Mayport turning basin and entrance channel, federal navigation channel, ODMDS, or nearby upland disposal sites.

4.1.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

Alternatives 7 and 11 propose construction of a new DESRON headquarters building; affecting the same 0.5-acre site with the same resultant impacts to soils as described for Alternatives 1 and 6 (see Section 4.1.1). Alternatives 3 and 9 propose no additional construction and would not have impacts to soils, geology, or topography on NAVSTA Mayport.

All Group 2 alternatives propose the dredging of 5.2 million cy of material from the NAVSTA Mayport turning basin and entrance channel and federal navigation channel. The shoreline around the turning basin is protected by existing wharf structures and the NAVSTA Mayport entrance channel is protected by rock jetties; thus, erosion of the shoreline is not expected to occur.

Dissolved organic and inorganic pollutants in the environment may become adsorbed to marine sediment particles. Recent sediment tests in NAVSTA Mayport turning basin have detected only low concentrations of contaminants in the proposed dredged prism. As further detailed in Section 4.3.2, project-specific data on sediment types and current velocities were input into a model that was used to estimate how long sediment would be suspended after cessation of dredging activities. The results of the model indicate that following the cessation of dredging activities, evidence of suspended sediment would: (1) rapidly disappear within an hour and would totally disappear within four hours of clamshell dredging within the NAVSTA Mayport turning basin, and (2) would totally disappear within one hour of hopper dredging within the NAVSTA Mayport entrance channel and federal navigation channel. Thus, suspended chemically impaired marine sediment, while having a short-term effect on water quality, would not be a long-term issue related to dredging required under Group 2 alternatives.

Dredged material would be disposed of in an USEPA-managed ODMDS (2 million cy to Jacksonville ODMDS and 3.2 million cy to Fernandina ODMDS; see Section 4.1.2.3 below) and would not impact upland topography, geology, and soils. The placement of material at an upland disposal site would only be necessary for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal. As discussed in Sections 2.3.1.2 and 3.1.5.1, MPRSA Section 103 Evaluation chemical and biological testing of sediments was completed by USACE after publication of the DEIS. The results indicate that more than 4.8 million cy of the material meets the USEPA Section 103 suitability criteria for ocean disposal. One zone (Zone 4, see Figure 3.1-8) failed slightly the bioassay portion of the Section 103 testing. This segment represents approximately 315,000 cy of the total 5.2 million cy project. The material in Zone 4 is predominately coarse sand with some clay and silt. Chemical results do not indicate a reason for the bioassay failure. Based on the bioassay test results, material type, and chemical data, it is likely the failure was due to factors other than contamination of the sediments. As the test results were very close to passing the criteria (test results were 70 percent survival rate, but 71 percent survival rate is needed for a passing test), this segment of the proposed dredging area is being re-tested for the bioassay portion of the Section 103 requirements (Ross 2008). As noted in Section 3.1.5.1, USACE Jacksonville District provides public access to Section 103 testing results via the website: http://planning.saj.usace.army.mil/envdocs/envdocsb.htm. Once available, the Section 103 testing results completed during the permitting phase will be posted at this site, under Duval County.

In the event that any material is not verified by USEPA Region 4 as suitable for ocean disposal, dredged material would be placed at existing permitted upland disposal sites in the vicinity of NAVSTA Mayport. Existing permitted upland disposal sites are available for disposal of dredge material (see Table 3.2-2). Such sites have been designed with measures to prevent long-term significant erosion and/or control sedimentation.

4.1.2.1 Dredging - Physical Effects on Sediments and Benthos

Potential sedimentation impacts were evaluated in the hydrodynamic modeling effort and are discussed in detail in Section 4.3.2.2, along with other results of this modeling effort. Direct impact to the sediment benthic habitats and their organisms would occur resulting from excavation of the federal navigation channel and NAVSTA Mayport entrance channel and turning basin to the anticipated project depths. Benthos at all of these sites has been previously impacted by past construction dredging and periodic maintenance dredging. As with these past projects, excavation associated with the proposed dredge project would result in temporary and reversible impacts to the benthos at their respective locations. Although the proposed total depth of -52 to -54 ft MLLW would be deeper than the area affected by previous projects, the effects to benthos would be similar. Excavation of sediment in the project area would result in mortality for many of the smaller benthic infaunal organisms residing on the bottom. Many of the larger, more mobile benthic species (such as crabs) would be able to flee the disturbed area. Following dredging activities, colonization of the substrate within the dredged areas is expected via larval recruitment and benthic organisms migrating from the surrounding area (DoN 2004a). However, the rate of re-colonization and the type and abundance of benthic invertebrates re-colonizing the bottom would depend on both abiotic and biotic factors. Changes to these abiotic factors (i.e., physical substrate conditions, water temperature, DO content, and salinity) and biotic factors (i.e., succession, recruitment, competition, and biogeography) would be minimal as a result of the dredging project. The new substrate would be varied and similar to the existing substrate, and would be expected to support existing benthic organisms.

The re-colonization of the dredging and disposal areas would likely progress in successive stages, with dominant species varying over time. Although exact community assemblages are hard to predict to the species level, the life history attributes and functional organism-sediment relationships are typically predictable. The specific nature of the benthic recovery process would largely depend on the timing of the disposal operation, local habitat characteristics, and which species exist in the surrounding areas to form source populations for re-colonization. Typically, the first colonizing species to arrive to a recently disturbed area are “opportunistic” (Stage I) tubiculous polychaetes or oligochaetes (Science Applications International Corporation [SAIC] 2001a and 2001b).

Eventually, the Stage I pioneering benthic invertebrate community is succeeded by a transitional (Stage II) community, which may include deeper burrowing organisms employing additional feeding strategies. The Stage II organisms within nearby undisturbed areas will likely provide a source population for colonization of the disturbed areas. Over time, a Stage III equilibrium community is reached, barring any repeated or continual biotic or abiotic disturbances. In a Stage III equilibrium community, all benthic invertebrate functional groups are represented. That is, the species partition their niche by varying feeding depth, employing different feeding techniques, and represent various feeding guilds (e.g., planktivores, predators, and detritivores). Some Stage I organisms may persist in the Stage III communities (SAIC 2001a and 2001b).

As the benthic invertebrate community succeeds to Stage III equilibrium, prey availability to finfish may decrease as a greater percentage of the benthic infauna reside deeper within the sediment. Stage III benthic invertebrate organisms typically do not exhibit significant seasonal changes in abundance or biomass. The abundant mobile species would easily re-colonize the water column quickly via immigration after cessation of construction activities. The more stationary species, especially the bivalves, would re-colonize at a slower rate via settlement of propagules from nearby populations adjacent to the project area (SAIC 2001a and 2001b).

Therefore, while there would be localized impacts to the benthic invertebrate community, the impact within the project areas under these alternatives would be minimal and temporary in nature.

4.1.2.2 Ocean Disposal - Physical Effects on Sediments and Benthos

Direct impact to the sediment benthic habitats and their organisms would occur from disposing dredged material at the previously disturbed ODMDS sites. As dredged material is placed at the ODMDS, most sessile (stationary) marine invertebrates are not expected to survive burial. Some motile (capable of movement) marine organisms would be buried and unable to survive, while others such as burrowing specialists, may survive. Survival rates depend primarily on burial depth. However, repeated burials would weaken most benthic, motile organisms, resulting in direct or indirect mortality (e.g., greater susceptibility to predation) since most disposal events would likely result in greater than 11 inches deposition of dredged material.

As detailed in Sections 3.1.5.3 and 3.1.5.4, previous benthic studies of the Jacksonville and Fernandina ODMDSs have shown similar data for benthic communities within and just outside the disposal sites (USEPA 1999a, 2006a). While the abundance of the species is similar inside and outside the ODMDSs, the composition of benthic species differs slightly with the changes in surficial substrata caused by disposal of dredging projects at the sites. Specifically, assemblages within ODMDS are dominated by various polychaetes; while a mixed assemblage of polychaetes, bivalves, and gastropods occur outside the ODMDS. However, the considerable uniformity in community indices and abundance both within and outside the ODMDS indicates the benthic habitats within the ODMDS are healthy (USEPA 2006a). Therefore, while there would be localized impacts to the benthic invertebrate community, the impact within the project areas under Group 2 alternatives would be minimal and temporary in nature.

4.1.2.3 Ocean Disposal – Effects on ODMDS Capacity

As discussed in Section 3.1.5, capacities of the Jacksonville and Fernandina ODMDSs are a concern. A limited number of dredged material upland disposal sites are available or feasible for use by ongoing federal navigation projects, and ODMDSs have been temporarily restricted to certain annual dredge disposal volumes pending completion of USEPA/USACE re-evaluation of the total capacities at the Jacksonville and Fernandina ODMDSs in 2008. The capacity re-evaluation has been completed at the Jacksonville ODMDS and the 2 million cy annual limit remains in effect. The re-evaluation has not yet been completed for the Fernandina ODMDS. For purposes of analysis in the DEIS, it was assumed that the full 5.7 million cy (volume originally estimated in the DEIS) would be disposed of in a single ODMDS in order to evaluate the maximum environmental impact on either ocean disposal site. However, as discussed in Section 2.3.1.1, based on the results of hydrodynamic modeling (Appendix A.5) completed since publication of the DEIS and historical USACE maintenance dredging information, advance maintenance dredging is only proposed in the FEIS in three fast shoaling areas of the proposed project, which reduces the estimated dredge material volume from 5.7 million cy to 5.2 million cy, or approximately 500,000 cy less than proposed in the DEIS.

The Jacksonville ODMDS is the closest to NAVSTA Mayport and has been the preferred disposal site for its maintenance dredging projects since 1993. The USACE, in their 2005 Jacksonville Harbor Dredged Material Management Plan (DMMP), estimated that the Jacksonville ODMDS has a total remaining capacity range of approximately 8 to 15 million cy (USACE 2005b). Capacity estimates performed as part of the DEIS calculated a slightly different total remaining capacity range of 9.3 million cy to 25.4 million cy. Capacity estimates calculated as part of the DEIS for the Fernandina ODMDS range from a low estimate of 64.8 million cy to a high estimate of 142.3 million cy, or roughly seven times the capacity of the Jacksonville ODMDS. The proposed 5.2 million cy of material represents approximately 55 percent of the remaining capacity of the Jacksonville ODMDS and 8 percent of the Fernandina ODMDS capacity. As such, placement of the full amount of dredged material in the Jacksonville ODMDS would consume a substantial amount of its remaining capacity.

For the DEIS, the Navy completed preliminary runs of the MDFATE model to simulate proposed disposal of the originally proposed 5.7 million cy of dredged materials in the Jacksonville and Fernandina ODMDSs. The 5.7 million cy estimate was the disposal volume estimated for a uniform dredge depth of -54 ft MLLW analyzed in the DEIS. With the modified dredge project developed for the FEIS, this dredge disposal volume estimate is reduced by approximately 10 percent to 5.2 million cy. Therefore, the lower volume of dredged material would have an approximately 10 percent lower effect on available capacity at the ODMDSs than would the 5.7 million cy disposal volume modeled in MDFATE. In the MDFATE modeling effort conducted as part of the DEIS, the Navy used 2007 bathymetric survey data and six months' worth of current and wave data collected at each site by the USEPA in 2007. Table 4.1-1 identifies input parameters and assumptions used for both runs of the model.

Three separate MDFATE simulations were completed for each ODMDS, one for each of the material source locations (NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigation channel). Individual barge disposal locations were randomly distributed within a 500 ft buffer inside each ODMDS boundary so that none of the disposed material would fall outside the boundary.

Disposal of the turning basin dredge volume was simulated in MDFATE by modeling the release of individual 4,000 cy barge loads randomly distributed within the 500 ft buffer inside the ODMDS boundary. Simulation of the turning basin dredge volume disposal used the 2007 survey bathymetry as the base bathymetry.

Table 4.1-1 Jacksonville and Fernandina ODMDS Capacity Estimate MDFATE Inputs and Assumptions (for Disposal of 5.7 million cy of Dredge Material)

	NAVSTA Mayport Turning Basin	NAVSTA Mayport Entrance Channel	Federal Navigation Channel
Volume (cy)[1]	1,447,025	1,140,843	3,088,231
Dredge Method[2]	clamshell	clamshell	clamshell
Current Data	six months (2007)	six months (2007)	six months (2007)
Tidal Current	see Appendix A.2	see Appendix A.2	see Appendix A.2
Residual Current	8 cm/s @184deg	8 cm/s @184deg	8 cm/s @184deg
Wave Height (ft), Period (s)	3.6, 10	3.6, 10	3.6, 10
Sediment Type[3]	Sand-Silt-Clay	Sand-Silt-Clay	Sand-Silt-Clay
Barge Solids (Percent)	40	40	40
Barge	4,000 cy split hull	4,000 cy split hull	4,000 cy split hull
Disposal Locations	Randomly distributed within the ODMDS	Randomly distributed within the ODMDS	Randomly distributed[4]

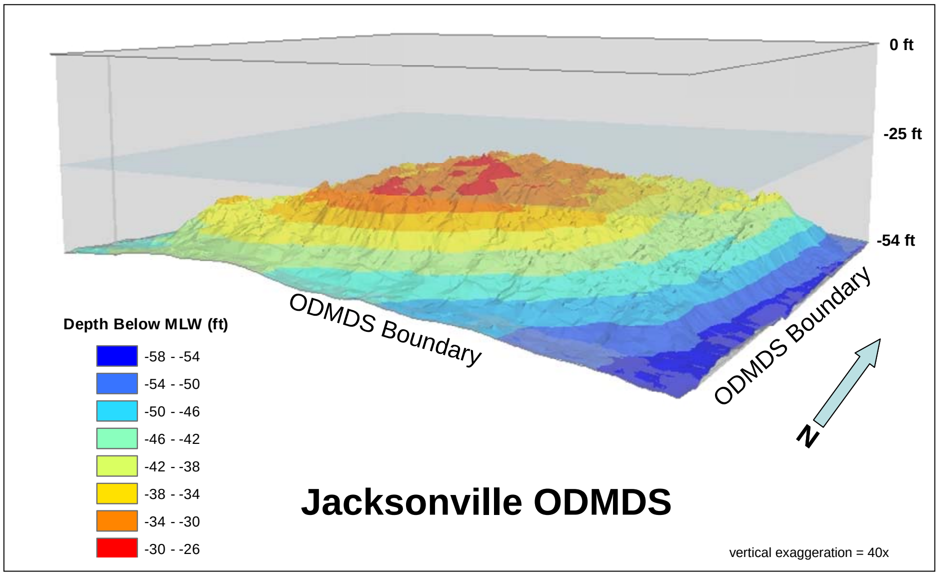
Notes:

[1] This MDFATE model was run as part of the DEIS which proposed and estimate of 5.7 million cy of dredge material. For the FEIS, the dredge estimate has been reduced to 5.2 million cy because advance maintenance of certain areas is no longer proposed.

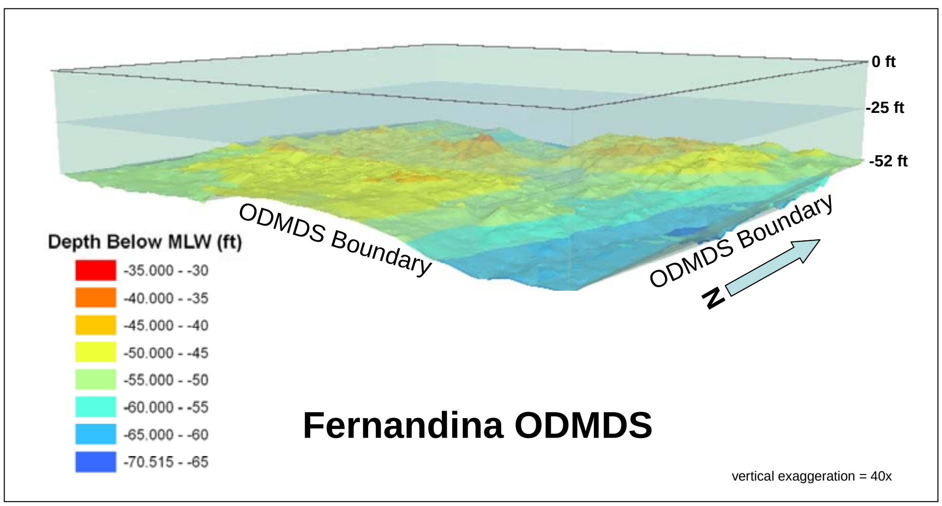
[2] Clamshell equipment was used as representative equipment likely to be available from the industry and can be used throughout the year within restriction. A hopper dredge could be used in portions of the entrance channel and federal navigation channel, which would increase somewhat the initial bulking factor of the sediment. However, the end result of the model run would be the same in that the ODMDSs have enough capacity to receive dredged material from the proposed project.

[3] Sediment size distribution based on ODMDS Capacity Estimate study (see Appendix A.2)

[4] Barge disposal locations randomly distributed in water depths deeper than approximately -30 ft for modeling of federal navigation channel material disposal



View of the Jacksonville ODMDS from the southeast. Seabed depiction is based on June 2007 depth survey data and disposal volume as predicted by MDFATE simulation. The volume does not exceed the -25 ft navigation limit.



View of the Fernandina ODMDS from the southeast. Seabed depiction is based on June 2007 depth survey data and disposal volume as predicted by MDFATE simulation. The volume does not exceed the -25 ft navigation limit.

Figure 4.1-1 Simulated View of Jacksonville and Fernandina ODMDSs Following Disposal of 5.7** million cy **of Material at Each Site

Note: This MDFATE model was run as part of the DEIS which proposed an estimate of 5.7 million cy of dredge material. For the FEIS, the dredge estimate has been reduced to 5.2 million cy because advance maintenance of certain areas is no longer proposed.

Next, the NAVSTA Mayport entrance channel dredge volume simulations used the results from the turning basin simulations as the starting bathymetry, and modeled individual 4,000 cy barge loads randomly distributed inside the ODMDS 500 ft boundary buffer. Last, the federal navigation channel dredge volume simulations were modeled using randomly distributed individual barge loads as well, but the results showed that the -25 ft navigation limit would be exceeded by several feet in the central part of the Jacksonville ODMDS where a mound of previously disposed material exists. Therefore, this segment of the MDFATE modeling was re-run for the Jacksonville ODMDS, but with individual barge disposal locations redistributed within the ODMDS boundaries only in areas deeper than approximately -30 ft deep. The results from this final simulation indicate that proposed dredge volumes would fit within either ODMDS. Figure 4.1-1 shows simulated views of the Jacksonville and Fernandina ODMDSs following disposal of 5.7 million cy (original volume proposed in the DEIS) of estimated dredged material as predicted by the MDFATE model simulations.

The preliminary MDFATE modeling results indicate the total estimated in-situ dredge volume of approximately 5.7 million cy proposed in the DEIS would fit within the boundaries of either ODMDS below the -25 ft navigation limit, but to do so at the Jacksonville ODMDS would require managing the material release zone for the Jacksonville site. The Fernandina ODMDS site is of sufficient size that managing the material release zone is not required in the simulation.

Additionally, the simulation is based on an approximately 20 percent bulking factor for the deposited dredged material. The bulking factor represents a real increase in the size of the in-situ dredged material once the material is excavated, placed in the barge, and disposed at the ODMDS. The bulking factor can differ depending on the nature of the sediment. For example, silty sediment would tend to expand or bulk more than would sand. The 20 percent estimate was based on the nature of the project dredged material. It is added to the in-situ volume for planning purposes that translate into to the number of required barges and volume of material that will be disposed at the ODMDS (i.e., each 4,000 cy barge load has a potential volume on the seabed of 4,816 cy). Such bulking factors are commonly used by USACE and others for planning purposes. This factor results in an estimated bulking of the original 5,676,099 cy volume to a total sediment volume on the seabed of 6,811,319 cy that would be added to the ODMDS from dredging the three components of the project. Of course, over time, that volume would be partially dispersed and consolidated.

Based on this information, the DEIS indicated the full volume of sediment could be placed in accordance with the Jacksonville ODMDS SMMP which allows continued use of the ODMDS if new dredge construction volumes do not exceed estimated capacity of the ODMDS. As mentioned previously, the

Navy estimates the overall remaining capacity of the Jacksonville ODMDS to be at least 9.3 million cy based on 2007 bathymetric survey information.

The one time use for disposal of 5.2 million cy (the volume proposed in the FEIS) under Group 2 alternatives, however, would eliminate substantial available capacity of the Jacksonville ODMDS that would be lost to other potential users in the future, including the ongoing maintenance dredging needs of NAVSTA Mayport, the USACE for the Federal Navigation Project, and others. Assuming a current available total volume of approximately 9.3 million cy and an estimated disposal volume (bulked) of approximately 6.2 million cy for this proposed Navy project (5.15 multiplied by the 20 percent bulking factor), there would be a remaining total volume of approximately 3.1 million cy capacity in the Jacksonville ODMDS following disposal of the proposed material. This capacity likely would be depleted within a few years following disposal of the proposed materials; assuming ongoing NAVSTA Mayport and USACE Jacksonville Federal Navigation Project maintenance projects continue to be disposed of in the Jacksonville ODMDS. Under such scenario, it would be necessary for USEPA to evaluate the feasibility of expanding the Jacksonville ODMDS and/or conduct appropriate studies and surveys of future ocean areas that may be appropriate for placement of suitable dredged material from NAVSTA Mayport, USACE Federal Navigation Project, and other users in the region. The Navy currently is supporting USACE and USEPA efforts to re-evaluate remaining capacity at the Jacksonville ODMDS to determine whether planning for additional or expanded capacity for ocean disposal is needed for the region.

With a capacity of at least 64.8 million cy, the disposal of a portion or all of the 5.2 million cy (or 6.2 million considering the bulking factor) of dredged material in the Fernandina ODMDS would have minimal impact on its remaining capacity, leaving a minimum of 58.6 million cy of available capacity in the Fernandina ODMDS. Furthermore, use by the Navy of the Fernandina ODMDS for disposal of any portion of the dredged material would lessen the impacts on Jacksonville ODMDS capacity.

In the DEIS, the Navy recommended that the proposed project dredged material volume be split between the two ODMDSs so as to not adversely affect the available capacity at Jacksonville ODMDS. The Jacksonville SMMP (USEPA and USACE 2007) includes the historical use of the ODMDS. From 1996 to 2006, approximately 4.8 million cy of dredged material was permitted for placement at the Jacksonville ODMDS over that 11 year period. This represents an average of approximately 440,000 cy per year. (Note: the historical use of the ODMDS does not equate to the total volume of material dredged in the region, as the USACE used some volume of dredged material for beach nourishment or disposed of it upland, as appropriate). When considering two additional recent disposal events at the ODMDS that occurred in 2007 (approximately 510,000 cy for the Federal Navigation Project) and 2008 (approximately 635,000 cy for the NAVSTA Mayport turning basin and entrance channel), the average disposal volume at the Jacksonville ODMDS increases to approximately 460,000 cy per year over that 13 year period.

More than 80 percent of the material has been from maintenance dredging from the NAVSTA Mayport turning basin and entrance channel. This area is typically maintained on a biannual basis. The remaining volume has come from the federal navigation channel including Bar Cut 3 from the jetties near NAVSTA Mayport to the open ocean. The SMMP and DMMP (USACE 2005a) prepared by the USACE, Jacksonville District indicate that the use of the ODMDS has been limited to maintenance dredging projects and future new work of the USACE has not been programmed into the future use of this ODMDS. Additionally, the DMMP indicates that suitable sand for beach nourishment is derived from the maintenance dredging projects in the NAVSTA Mayport entrance channel. However, it is understood that the 2007 maintenance dredging project was rejected for beach nourishment by FDEP for containing too much silt, thereby adding further to the volume of material that is probable for placement at the ODMDS. The updated SMMP continues the limitation of 2 million cy per year for dredged material placement at the Jacksonville ODMDS (USEPA and USACE 2007).

The physical capacity at the Jacksonville ODMDS has been estimated (see Appendix A.2) using a simple geometric measurement of the latest 2007 bathymetric survey compared with management restrictions for use of the site noted above. These restrictions are to keep the deposited dredged material within the one mile square boundary and below a cumulative elevation of -25 ft MLLW. This estimate depicts a low volume of 9,310,347 cy and a high volume of 25,378,406 cy of remaining capacity at the Jacksonville ODMDS in 2007. It is recognized that the Jacksonville ODMDS needs to be expanded or a new site designated by USEPA to enable continued disposal of maintenance dredging in the region from NAVSTA Mayport, the federal navigation channel, and others that use Jacksonville ODMDS; therefore, 10 years of maintenance capacity are used to determine viability. Based on the historical use of the site, the estimated remaining capacity using the low estimate of 9.3 million cy and the volume of dredged material that would be generated in the proposed project, the following provides an estimate of the status of the Jacksonville ODMDS over the next ten-year period:

PROJECTED TEN-YEAR STATUS OF JACKSONVILLE ODMDS

<u>Maintenance Volume:</u> 460,000 cy (historical annual average) + 30,000 cy (projected increase from proposed project) = 490,000 cy annual average

<u>Ten-Year Maintenance Volume</u>: 10 X 490,000 cy (avg. annual maintenance projects) = 4.9 million cy

<u>Proposed NAVSTA Mayport Deepening</u>: 5.2 million cy

<u>Ten-Year Impact on Low Volume Estimate</u>: 4.9 million cy + 5.2 million cy = 10.1 million cy, which is 109 percent of available 9.3 million cy capacity of Jacksonville ODMDS

Note: [1]The projected increase of 27,500 cy annual maintenance dredge increase resulting from the proposed deepening is conservatively rounded to 30,000 cy (see Section 2.3.1.1).

Although the MDFATE model determined that the 5.7 million cy of dredged material (original volume proposed in the DEIS) from the proposed NAVSTA Mayport deepening project could fit within either the Jacksonville or Fernandina Beach ODMDS, the capacity of the Jacksonville ODMDS would be exceeded within the ten-year planning horizon due to the additional placement of an estimated 4.9 million cy of material also generated by maintenance projects over this timeline. Therefore, the Navy is working closely with regulators to ensure Navy disposal needs are met, whether at the Jacksonville or Fernandina ODMDS, or a combination of both. As a result, the Navy proposes to dispose of portions of the 5.2 million cy of dredged material in each ODMDS, including the placement of 2 million cy in the Jacksonville ODMDS and the remaining 3.2 million cy in the Fernandina ODMDS.

Since the publication of the DEIS, the USACE in association with USEPA has prepared an updated assessment of available capacity of the Jacksonville ODMDS to accept dredged material. Their May 2008 Draft report entitled *Jacksonville Ocean Dredged Material Disposal Site Capacity Report* is contained in Appendix A.6 of this FEIS and summarized below.

The Jacksonville ODMDS capacity report was prepared following the collection of one year of wave and current data at the site. Recent (2008) bathymetry surveys were taken and used as a baseline to estimate available remaining space within the ODMDS pursuant to site management criteria that maintains the site so that it does not pose a navigational hazard; that the dredged material does not accumulate outside of the disposal site boundaries; and that the maximum utilization of the site's capacity is attained. That bathymetry of the site indicates the elevation along the site boundary ranges from -46 ft to -57 ft MLLW while the elevation of the center of the site is at or near -30 ft MLLW. Dredge material disposal contractors are now directed away from the center portion of the ODMDS to avoid breaching the minimum depth criteria of -25 ft MLLW identified in the SMMP. Also, the center portion of the site was not included in the capacity analysis.

The capacity Report used the MDFATE model that was also used by the Navy in its analyses published in the DEIS. For this reassessment, the disposal volume assumed 2 million cy (new work) from the proposed NAVSTA Mayport deepening project and 800,000 cy of annual maintenance dredging. The 800,000 cy of annual maintenance dredging is a conservative estimate that includes the annual average of 440,000 cy identified in the Jacksonville ODMDS SMMP as well as additional maintenance needs anticipated by USACE in the future. The types (silt, clay, and sand) of dredged sediment were estimated using data collected by the Navy for the proposed NAVSTA Mayport deepening project and from historical records on maintenance sediment from the NAVSTA Mayport turning basin and entrance channel and federal navigation channel.

The conclusions of this draft capacity USACE report confirm that the Jacksonville ODMDS can accommodate the 2 million cy of new work from the proposed NAVSTA Mayport deepening project. The remaining ODMDS capacity would allow 8 to 10 years or 6.4 million cy to 8.0 million cy of additional maintenance (in-situ or in-place) without violating the SMMP criteria. The draft report also indicates that the MDFATE analysis is being followed by additional modeling (Long Term FATE) of the Jacksonville ODMDS. This latter modeling estimates the amount of dispersion and/or disposition potential of dredged material after disposal and over time at the site. Historical records of dredged material and disposal at the Jacksonville ODMDS indicate that portions of the disposed material (particularly silt) do not remain at the site, but are dispersed by waves and currents. Therefore, the capacity estimates provided in this draft report may be considered conservative as the Long Term FATE model runs likely will show more available capacity and the estimate stated above represents a practical minimum estimate of capacity.

Therefore, the Navy’s proposed dredge material disposal option under Group 2 alternatives is to place 2 million cy of material at the Jacksonville ODMDS and 3.2 million cy at the Fernandina ODMDS.

4.1.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

All Group 3 alternatives would disturb approximately 15 acres of soils for the development of CVN nuclear propulsion plant maintenance facilities in an area currently occupied by surface parking lot and stormwater drainage and swale area. Soils in this area are characterized primarily as near level arents (nearly level) with some urban land (see Figure 3.1-1). In addition, this group includes the widening of

Massey Avenue, and improvements to four intersections along Massey Avenue and two intersections along Moale Avenue, estimated to disturb a cumulative area of approximately 12 acres of disturbed roadside soils and shoulder areas, including drainage ditches. Soils in the areas affected by transportation improvements are mostly characterized as urban land with some arents and mandarin fine sand at the site of the Massey Avenue/Maine Street intersection improvements (see Figure 3.1-1).

Alternatives 4, 8, and 10 also include construction of a parking structure northwest of the Fire Station and west of New Maine Street affecting an approximately 3-acre site of currently paved surface on urban land soils. Alternative 12 includes the construction of this parking structure plus the construction of a second parking structure at the southeast corner of Supply Street and Bailey Ave affecting an approximately one-acre current parking surface on arents soils. Alternatives 8 and 12 also include the construction of the DESRON headquarters building, affecting an estimated 0.5-acre area.

Group 3 alternatives would have the same impacts to soil resources as for Group 1 alternatives (i.e., short-term construction impacts associated with earth moving activities minimized by management measures addressing erosion and sediment control and long-term impacts, see Section 4.1.1). However, the scale of the impacts would be greater as these alternatives each would disturb approximately 30 to 32 acres. A Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems (detailed in Section 4.11.3) would be required. A construction site SWPPP and Environmental Resource Permit erosion and sediment control measures (i.e., BMPs) would need to be implemented within the area of potential development. In order to comply with the regulations on TMDLs issued in December 2007, new impervious discharges would be addressed during site design and mitigation implemented to prevent additional nutrients from entering receiving waters (i.e., the St. Johns River). As NAVSTA Mayport's existing MSGP and MS4 permits are general permits, they would not be modified. However, the SWPPP associated with the MSGP would need to be modified with the new industrial activities associated with the nuclear propulsion plant maintenance facilities and the MS4 management plans and goals may require modification to address the new impervious surface activities (Dombrosky 2007). (See also Sections 4.3.3.2 and 4.11.3.5.)

The impacts of dredging on marine sediment and the impacts on ODMDS capacity under the Group 3 alternatives would be the same as described for the Group 2 alternatives.

4.1.4 No Action Alternative (Alternative 13)

No impacts to earth resources would be expected as a result of the No Action Alternative at NAVSTA Mayport.

4.1.5 Mitigation Measures

Under Group 1 and Group 2 alternatives, construction activities would disturb less than one acre. With the implementation of BMPs to control soil erosion (e.g., temporary gravel construction entrance, straw bale/brush barriers, silt fencing, storm drain inlet protection, temporary stormwater diversion, sediment traps/basins, etc.), there would be no significant impacts to topography, geology, and soils. An Environmental Resource Permit for Stormwater Management Systems would be required (combined impervious surface is greater than 9,000 sf) and associated erosion and sediment controls implemented. Under Group 3 alternatives, disturbance of 30 to 32 acres would require issuance of a Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems. Construction would occur within the requirements of those regulations and permits. With the addition of a new industrial activity under the Group 1 and 2 alternatives, the NAVSTA Mayport SWPPP would need to be modified and the MS4 management plans and goals may need to be modified to address new impervious surface activities. All alternatives would be subject to the December 2007 TMDL regulations, which require new impervious discharge to be addressed during site design and mitigation implemented to prevent additional nutrients from entering receiving waters. Mitigation in the form of implementing BMPs for stormwater runoff from construction sites and long-term stormwater controls would be implemented to treat and remove nutrients from stormwater before it enters receiving waters (i.e., the St. Johns River) or prevent it from entering receiving waters (Dombrosky 2007). The specific plan for stormwater control would be addressed during the design and permitting phase of the project. The footprint for this mitigation would be within the identified area of potential development evaluated in this EIS.

Under all Group 2 and Group 3 alternatives, dredging would occur and dredged material is proposed for disposal of 2 million cy at Jacksonville ODMDS and 3.2 million cy at Fernandina ODMDS. In accordance with MPRSA Section 103 requirements, the Navy is conducting appropriate biological testing of dredged material during the permitting process as required by USACE and USEPA to verify the suitability for ocean disposal at a USEPA-managed ODMDS (see Section 3.1.5.1).

As a member of the Jacksonville ODMDS SMMP Team, under Group 2 and Group 3 alternatives, the Navy would continue to support the USACE Jacksonville District and USEPA Region 4 in determining appropriate disposal practices and potential management options at the Jacksonville ODMDS, including possible expansion of the Jacksonville ODMDS under MPRSA Section 102 if deemed necessary by USEPA Region 4.

4.2 LAND AND OFFSHORE USE

Factors considered in evaluating land use impacts include the following:

- Compatibility with land use surrounding NAVSTA Mayport;
- Changes to on or off-Station land use that could degrade mission;
- Consistency with the environmental goals, objectives, or guidelines of the City of Jacksonville, City of Atlantic Beach, or Duval County comprehensive plan for the affected area; and
- Activities affecting Florida's coastal zone and consistency to the maximum extent practicable with the enforceable policies of the FCMP.

4.2.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

The impacts to land use from Group 1 alternatives would be minor and localized to the construction site for the DESRON headquarters building under Alternatives 1 and 6 or the PHIBRON headquarters under Alternative 5. The existing land use at the 0.5-acre site, "personnel support" (see Figure 3.2-2), would be converted to "command and control." This is not a change that would degrade mission-essential operations. The actual current use of the site is vacant and intermittently used by contractors as a laydown area. The site is previously disturbed; facilities present at the site in the past have been demolished. There are no airfield or explosive safety development constraints at this site that would preclude development of this site for administrative command and control purposes (see Figure 3.2-3). AT/FP setbacks (33 ft between the adjacent roadways and any parking) and Base Exterior Architecture requirements would be incorporated into the site design for the facility. Necessary design considerations for the facilities, including hurricane protection, also would be addressed in this design phase and incorporated into construction specifications.

No direct off-Station land use impacts would occur under Group 1 alternatives. There could potentially be indirect impacts to land use in the vicinity of NAVSTA Mayport as a result of the projected losses in base population that would occur under these alternatives. NAVSTA Mayport personnel and their dependants support local commercial businesses (and many in the area cater to the Navy population), occupy local community housing, and recreate in the local area. Losses would be greatest under Alternative 1 (approximately 2,800 decrease in net daily population), followed by Alternative 5 (approximately 2,600 decrease in net daily population), Alternative 2 (approximately 2,300 decrease in net daily population), and Alternative 6 (approximately 1,200 decrease in net daily population). With the efforts to revitalize the Village of Mayport and Mayport Road Corridor areas, and the immigration and growth of the beaches and Mayport area, local land use could transition somewhat. It is unlikely that there would be large scale changes to the distribution of land uses in the local area. Most likely, there would be changes to the types of commercial and residential uses within or near areas that currently support such uses. Impacts to recreation areas and natural resource management and use would be minimal.

The actions under all Group 1 alternatives would be consistent with the environmental goals, objectives, and guidelines of the consolidated Duval County/City of Jacksonville government and nearby City of Atlantic Beach. Furthermore, the action under all Group 1 alternatives would be consistent to the maximum extent practicable with the enforceable policies of the FCMP. FDEP reviewed the DEIS and determined it to be consistent with the FCMP (see Appendix C). Under the Group 1 alternatives, it is unlikely that any follow-on permitting with FDEP would be necessary. If, however, in the design phase for these facilities, it is found that the expected 0.5-acre area of potential disturbance under Alternatives 1, 5, or 6 would disturb greater than one acre of soil, the Navy would ensure continued concurrence with FDEP through the Construction Generic Permit and Environmental Resource Permit for Stormwater Management System processes. Therefore, there would be no significant impacts to land use under Group 1 alternatives.

4.2.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

The construction of the DESRON headquarters building under Alternatives 7 and 11 would have the same impact to on-Station land use as described for Group 1 alternatives (Section 4.2.1). Similar to Group 1 alternatives, local land use near NAVSTA Mayport could undergo transition related to the loss of personnel at NAVSTA Mayport. This would be most pronounced with the decrease of approximately 3,900 net daily population under Alternative 3; followed by decrease of approximately 2,800 net daily population under Alternative 7; decrease of approximately 2,300 net daily population under Alternative 9; and decrease of approximately 1,200 net daily population under Alternative 11.

All Group 2 alternatives would require dredging the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel. Proposed dredging activities and disposal of dredge materials in ODMDSs could potentially affect commercial and sport fisheries because increased sedimentation levels occurring from dredging operations can decrease the abundance of fish in the affected area. Local sport fishermen interviewed regarding this potential impact generally agreed that previous local dredging activities have had temporary negative impacts on fishing. The general consensus is that once sedimentation suspended in the water column as a result of dredging operations settles out of the water column, the fish return (see Section 4.3.2 for more details). Because the St. Johns River provides a high rate of water exchange, effects of suspended sedimentation on fishing is minimal. Some sport fishermen reported that dredging actually improves conditions for some fish including whiting, trout, redfish, and drum. They reported that the dredging action suspends invertebrates from the ocean bottom that attracts fish to the affected water column. In some instances, the deposition of dredged material at ODMDSs provides bait and draws kingfish, amberjack, and barracudas (Strate 2007, Sipler 2007, Waddill 2007, and St. Laurent 2007). Artificial reef sites are well east of the dredge project area and ODMDSs, and would not be impacted by dredging and dredge material disposal activities. If fishing tournaments were to occur during the period of dredging, localized minor impacts could occur. Therefore, the potential impacts to commercial and sport fishing as a result of the proposed dredging would be minimal and short-term.

Dredged material would be disposed of in an USEPA-managed ODMDS (2 million cy to Jacksonville ODMDS and 3.2 million cy to Fernandina ODMDS). The placement of material at an upland disposal site would only be necessary for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal (see Section 3.1.5.1). If any upland disposal were to occur, it would only occur at existing upland disposal sites and, therefore, this would be a consistent land use.

As with Group 1 alternatives, all Group 2 alternatives would be consistent with the environmental goals, objectives, and guidelines of the consolidated Duval County/City of Jacksonville government and nearby City of Atlantic Beach. Furthermore, all Group 2 alternatives would be consistent to the maximum extent practicable with the enforceable policies of the FCMP. FDEP reviewed the DEIS and determined it to be consistent with the FCMP (see Appendix C). Under the Group 2 alternatives, the Navy would continue to ensure consistency through the FDEP permitting process for the dredge project as well as in the FDEP Construction Generic Permit and Environmental Resource Permit for Stormwater Management System processes in the unlikely event that the 0.5-acre construction site associated with Alternatives 7 and 11 exceeds one acre. Therefore, there would be no significant impacts to land use under Group 2 alternatives.

4.2.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Under Group 3 alternatives, NAVSTA Mayport land use would be affected in localized areas resulting from construction of CVN nuclear propulsion plant maintenance facilities, parking structures, and traffic improvements. The CVN facilities would be located in an approximately 15-acre area currently serving as a surface parking lot. The site also includes Building 347, which provides approximately 700 sf of ships cable storage. Conversion of land use in this 15-acre area from “logistics” to “maintenance” would be compatible with adjacent land use (see Figure 3.2-2) and would not degrade mission-essential operations. Building 347 would be demolished and its storage function relocated to other existing facilities near the waterfront. Due to the transition of SERMC (see Section 1.3), excess ships maintenance space would become available in Building 1488, located in the existing maintenance area south of the site proposed for development of CVN nuclear propulsion plant maintenance facilities. During the design phase for the construction of the CVN facilities, this excess space could potentially be utilized for some non-controlled activities, possibly increasing efficiencies in maintenance facilities use and decreasing construction requirements at NAVSTA Mayport. There are no airfield or explosive safety development constraints at this site (see Figure 3.2-3).

The proposed CVN nuclear propulsion plant maintenance facilities would be constructed in accordance with current AT/FP requirements, which would likely require the 82-ft primary gathering building setback to cover the inhabitation of the buildings during the peak of the three-year maintenance cycle. Necessary design considerations for the facilities, including hurricane protection, also would be addressed in this design phase and incorporated into construction specifications. (See Chapter 5 for more details).

The parking structure west of New Maine Street proposed under all Group 3 alternatives and the second parking structure proposed under Alternative 12 are located at sites that serve as existing surface parking. The conversion of surface parking to parking structures would be consistent with current land uses.

Most of the transportation improvements proposed under Group 3 alternatives would not affect land use in that they involve slight modification of existing transportation infrastructure. Depending on final design, the proposed widening of Massey Avenue and the Massey Avenue/Maine Street intersection improvements could impact a nearby recreation pavilion/picnic area. Widening of Massey Avenue would have the effect of establishing a roadway closer to occupied structures and would thereby lessen existing building setbacks. The widening project final design would consider the DoD AT/FP standoff distances. Buildings that require the AT/FP 33 ft standoff distance for inhabited buildings located within 100 ft of the existing roadway include Building 1576 (Fleet and Family Support Center), Building 414 (MWR Offices), Building 191A (Warehouse Offices), and Building 1906 (Wastewater Treatment Plant Offices). Buildings that require the 82 ft AT/FP standoff distance for primary gathering buildings located within 150 ft of the existing roadway include Building 350 (Chapel) and Building 2104 (Branch Medical Clinic). Additionally, the existing roadway is approximately 195 ft south of the southernmost end of the NAVSTA Mayport turning basin.

The decrease in personnel and dependent population associated with Alternative 4 (decrease of approximately 1,600 in net daily population) and Alternative 8 (decrease of approximately 430 in net daily population) would have similar impacts as described for Group 1 and 2 alternatives. The increase in personnel and dependent population associated with Alternative 12 could result in indirect impacts to on-Station land use (increase of approximately 1,200 in net daily population). The net daily population of Alternative 10 would remain essentially the same as the baseline. In addition, under all Group 3 alternatives, there would be a surge in ships maintenance personnel on average of 750 personnel during the six-month availability maintenance cycles for the CVN (amounting to an increase of 375 in the annual net daily population in those years). Although there would be additional demand on personnel support land uses, most personnel facilities were constructed at a time when NAVSTA Mayport's population was higher than the 2006 baseline and would be able to accommodate increases without affecting overall land use patterns. Exceptions noted in Sections 2.4.3, 2.4.4, and 2.4.5 include fitness center (gymnasium) space, chapel/religious education, and playing fields. Implementation of current plans for expansion of the fitness center and chapel/religious education facilities would not be of a scale to affect overall land use patterns. However, if the additional demand on bachelor housing under Alternative 12 requires expansion of the housing footprint, land dedicated to personnel support at NAVSTA Mayport would be reduced.

Potential indirect impacts to land use in the vicinity of NAVSTA Mayport as a result of the projected losses in base population under Alternatives 4 and 8 would be as described for Group 1 alternatives. For Alternative 12, the increase in NAVSTA Mayport's personnel and dependent population would potentially result in increased demand for commercial and industrial services and housing in the local area. The increased demand under Alternative 12 could result in small-scale changes to commercial, industrial, and residential land uses in the area. In concert with revitalization efforts for the Village of Mayport and Mayport Road Corridor, these land uses could become more densely developed and potentially could expand. Much of the existing land use in the area is not developed to a "highest and best use," and would be available for conversion into more efficient land use compatible with existing land uses and zoning in the area. There could be increasing demand on local parks and recreation areas near NAVSTA Mayport, most likely impacting ballfields at nearby urban parks. However, there is ample opportunity for a wide variety of outdoor recreation in the vicinity of NAVSTA Mayport (see Section 3.2.4). These potential induced impacts to area land use are compatible with local plans for management and use and, therefore, would not be significant.

The impacts of dredging on land and natural resource management and use described for Group 2 alternatives also would apply to Group 3 alternatives (see Section 4.2.2). As with Group 1 and 2 alternatives, all Group 3 alternatives would be consistent with the environmental goals, objectives, and guidelines of the consolidated Duval County/City of Jacksonville government and nearby City of Atlantic Beach. Furthermore, all Group 3 alternatives would be consistent to the maximum extent practicable with the enforceable policies of the FCMP. FDEP reviewed the DEIS and determined it to be consistent with the FCMP (see Appendix C). Under the Group 3 alternatives, the Navy would continue to ensure consistency through the FDEP permitting process for the dredge project as well as in the FDEP Construction Generic Permit and Environmental Resource Permit for Stormwater Management System processes supporting construction of the nuclear propulsion plant facilities. Therefore, there would be no significant impacts to land use under Group 3 alternatives.

4.2.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, reduction in number of ships homeported and in overall net daily population would lead to less than full utilization of NAVSTA Mayport facilities. If facility utilization were consolidated to improve space utilization, there could be changes in land use patterns on NAVSTA Mayport. Although the specifics of changes cannot be predicted at this time, the resultant impact would not be expected to be significant. The loss in net daily population (approximately 3,900) and associated dependants would potentially contribute to transition of land use near NAVSTA Mayport as assessed for similar losses associated with Group 1 alternatives (see Section 4.2.1). There would be no adverse impacts on natural resource management or use under the No Action Alternative.

4.2.5 Mitigation Measures

There would be no significant impacts to land and natural resource management and use under any of the alternatives; therefore, no mitigation would be required for any alternative.

4.3 WATER RESOURCES

The following factors are considered in evaluating impacts to groundwater or surface waters:

- long-term increased inundation, sedimentation, and/or damage to water resources in the ROI caused by project activities, including impervious surfacing that increases and/or diverts rainfall runoff and/or affects its collection and conveyance and implementation of mitigation measures;

- depletion, recharge, or contamination of a usable groundwater aquifer for municipal, private, or agricultural purposes; and
- increases in soil settlement or ground swelling that damages structures, utilities, or other facilities caused by inundation and/or changes in groundwater level.

Impacts to wetlands were assessed based on potential for project activities to result in direct or indirect destruction or modification of delineated wetlands without mitigation.

Impacts to floodplains were assessed based on development within the FEMA 100-year floodplain and practicable alternatives to otherwise locate the development outside the floodplain and/or minimize potential harm to or within the floodplain.

4.3.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

4.3.1.1 Groundwater

Potential impacts to groundwater under Group 1 alternatives would be minimal and directly associated with upland construction of DESRON or PHIBRON headquarters facilities proposed under Alternatives 1, 5, and 6. The construction of these facilities would increase the area of impervious surfaces at NAVSTA Mayport by approximately 0.5 acres resulting in a slight decrease in infiltration of precipitation into the water table. Such impacts would not be significant.

4.3.1.2 Surface Waters

No dredging would occur under Group 1 alternatives, therefore there would be no direct impact to water resources in the NAVSTA Mayport turning basin, entrance channel, federal navigation channel, ODMDS sites, or upland disposal sites.

Construction activities could result in small localized changes in stormwater runoff flow depending on final grading of the construction site and total increase in the areas of impermeable surfaces. In order to comply with regulations on TMDLs issued in December 2007, new impervious discharge must be evaluated and mitigation implemented to prevent additional nutrients from entering receiving waters (i.e., the St. Johns River). Accordingly, stormwater would either be treated to remove nutrients before it enters or prevented from entering receiving waters. As discussed in Section 4.11.1, impacts of DESRON or PHIBRON headquarters facilities would be minimized by incorporating stormwater control measures (i.e., BMPs) into site and facility design, so no significant impacts to surface water would result. No new stormwater outfalls would be required. Based on current design plans, an Environmental Resource Permit for Stormwater Management Systems would be required since construction of either of the headquarters facilities and associated paved parking areas results in a combined impervious surface of greater than 9,000 sf (40C-42.022 FAC). Group 1 alternatives do not involve any dredging activities.

4.3.1.3 Wetlands and Floodplains

The site for the DESRON or PHIBRON headquarters facilities (Alternatives 1, 5, and 6) is not located within a FEMA floodplain and would not directly or indirectly affect any wetlands; therefore, there would be no significant impacts to wetlands or floodplains under Group 1 alternatives.

4.3.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

4.3.2.1 Groundwater

Group 2 alternatives include dredging to deepen the NAVSTA Mayport turning basin and entrance channel and federal navigation channel to a maximum total depth of -54 ft MLLW. Dredging activities are not anticipated to significantly impact groundwater in the vicinity. The Floridan aquifer is the most valuable groundwater resource in the project area and is used for much of the region's potable water needs. According to USGS mapping, the Floridan aquifer in Duval County is considered a confined aquifer and exists at a depth of more than 400 ft below the surface, with the confining layer unbreached and generally more than 100 ft thick (USGS 2006). Since the channel deepening would not exceed -54 ft MLLW, breaching the confining layer of the Floridan aquifer is highly unlikely and there would be no significant impact to groundwater.

Dredged material would be disposed of in an USEPA-managed ODMDS (2 million cy to Jacksonville ODMDS and 3.2 million cy to Fernandina ODMDS. The placement of material at an upland disposal site would only be necessary for any volume of material that does not meet MPRSA section 103 rules for ocean disposal (see Section 3.1.5.1). An FDEP Environmental Resource Permit is required for establishment and operation of existing upland disposal sites and a construction NPDES permit is needed for the construction of upland disposal sites. FDEP exercises regulatory authority over ground water quality under FAC Chapter 62-520. FDEP Environmental Resource Permits ensure that existing upland sites do not violate drinking water standards. In Florida, the ground water standards are equivalent to the drinking water standards. Depending on the particulars of the established dredged material disposal sites, various institutional and engineered controls are available to meet these standards. The most common groundwater monitoring is for saltwater intrusion (Hollingsworth 2007). Typically, upland disposal sites are managed so that the water stored is released back into surrounding surface waters after sufficient holding time has occurred to allow the sediments in the disposal area to settle and allow the return flow to meet surface water quality standards. As the discharge of material into the disposal area ceases, the site is dewatered slowly by lowering a set of weir boards eventually drying out the retained material. As a result, significant impacts to groundwater are not anticipated and an exceedance of drinking water standards would not occur in association with use of existing approved upland disposal sites.

Potential groundwater impacts resulting from upland construction of DESRON headquarters facilities would be the same as those described under Group 1 alternatives and would not be significant (see Section 4.3.1).

4.3.2.2 Surface Waters

This construction would result in minimal impacts to stormwater as described for Group 1 alternatives under Section 4.3.1, which would not be significant. Group 2 alternatives also have the potential for short term impacts on marine water resources from dredging and potential long term impacts on the hydrodynamic characteristics of the project area from deepening by up to 12 ft in some locations. Group 2 alternatives would have short term effects from dredged material disposal via ocean disposal in an ODMDS. These effects include both physical and chemical effects on water resources as discussed in the following paragraphs which address:

- Dredging - Physical Effects on Water Resources/Quality
- Dredging - Chemical Effects on Water Resources/Quality
- Ocean Disposal - Physical Effects on Water Resources/Quality
- Ocean Disposal - Chemical Effects on Water Resources/Quality
- Upland Disposal - Effects on Water Resources/Quality

<u>Dredging - Physical Effects on Water Resources/Quality</u>

The possible physical effects of removal of 5.2 million cy of sediment from the federal navigation channel in the St. Johns River and the NAVSTA Mayport turning basin and entrance channel would be:

- Minor changes to hydrodynamics of the river and the turning basin, and
- Temporary increases of suspended sediments in proximity to the dredging activities.

Hydrodynamic Effects

A hydrodynamic model was used to determine the effects of channel deepening on the currents and salinity intrusion in the lower St. Johns River and on the sediment transport and sedimentation in the areas of proposed dredging. The evaluation was conducted using the Environmental Fluid Dynamics Code (EFDC) hydrodynamic model, a state-of-the-art hydrodynamic model developed by Hamrick (1992) and endorsed by USEPA that has evolved over the past 20 years to become one of the most widely used and technically defensible hydrodynamic models in the world. The EFDC model was used to simulate currents in the lower St. Johns River and the NAVSTA Mayport turning basin, with an emphasis on predicting changes in currents, salinity intrusion, and sedimentation rates and patterns as a result of the proposed dredging. The primary objectives of this modeling were:

- To develop and calibrate a computer model that adequately simulates the physical processes (currents) that affect salinity in the St. Johns River and sediment transport in the study area, and
- To assess differences in currents, salinity intrusion, and sedimentation rates after dredging.

The EFDC model was successfully calibrated to the St. Johns River by Sucsy and Morris (2002). The calibration period extended from 1 January 1995 to 30 November 1998. Sucsy and Morris (2002) detailed the calibration effort and compared "simulated and observed harmonic constituents, subtidal water level, total water level, instantaneous salinity, tidally-averaged salinity, monthly-averaged salinity, total cross-sectional tidal discharge, daily-averaged discharge, and tidal velocity." Additional details of the success of the calibration, validation, and skill assessment of the model application are given in their report. The EFDC application to the St. Johns River by Sucsy and Morris (2002) is currently used by NOAA for forecasting water levels, currents, salinity, and temperature in the St. Johns River. These previous model applications became the basis for the present application by Applied Science Associates, Inc. (ASA) used by the Navy for this analysis.

The previously calibrated EFDC model application by Sucsy and Morris did not have adequate resolution of the model parameters in the federal navigation channel and did not include the NAVSTA Mayport entrance channel or turning basin. ASA refined the model grid to include these features and provide additional resolution in the federal navigation channel. A detail of the grid encompassing the federal navigation channel and NAVSTA Mayport entrance channel and turning basin is shown in Figure 4.3-1. The model representation of the bathymetry is also shown in that figure. The proposed dredging was simulated in the model by increasing the depth of the federal navigation and entrance channels and the turning basin to -54 ft MLLW.

The refined hydrodynamic model was used to simulate circulation in the study area for a two-year period – 1997 and 1998. This study period is appropriate as these years had periods of river flow close to the long-term average plus periods of low and high river flow representative of dry and wet seasons. Running the model for these two years provided simulations that are representative of the range of river conditions. Also, as noted above these two years were previously modeled by Sucsy and Morris (2002). Using the same approach described in the Suscy and Morris report, the time-variable water surface elevation at the open boundary in the ocean was specified using 21 tidal harmonic components and meteorological residues. Freshwater inflows to the river from upstream sources were obtained from data collected at 11 USGS gauging stations during 1997 and 1998. For 1997, the total, average daily freshwater inflow to the river system ranged from -12,600 cfs to 38,100 cfs, with an average value of 6,670 cfs. For 1998, the total freshwater inflow ranged from -14,500 cfs to 58,000 cfs, with an average of 10,800 cfs. The negative values represent a reversal of flows measured at the USGS stations and relates to tidal and meteorological events. Mean salinity at the open boundary was also the same as that used by Sucsy and Morris (2002), which was 35 ppt at the surface and 36 ppt at the bottom.

For the post-dredging scenario, the hydrodynamic simulations were conducted using the planned dredged depths in the NAVSTA Mayport turning basin and entrance channel and the federal navigational channel.

The hydrodynamic model was validated using two methods: (See Appendix A.5 for the complete discussion of the hydrodynamic model study).

- Quantitative evaluation of predicted and measured tidal elevations at the location of the NOAA Mayport tidal gauge, and
- Qualitative and quantitative comparisons with data presented by Headland (1991)

Based on the results documented in the hydrodynamic model study (Appendix A.5), it was concluded that the model realistically simulated the primary transport processes in the study area, which were documented by Headland (1991), and which affect sedimentation in the NAVSTA Mayport turning basin. The model also reproduced the expected changes in water circulation patterns generated by freshwater inflow and neap-spring tide conditions.

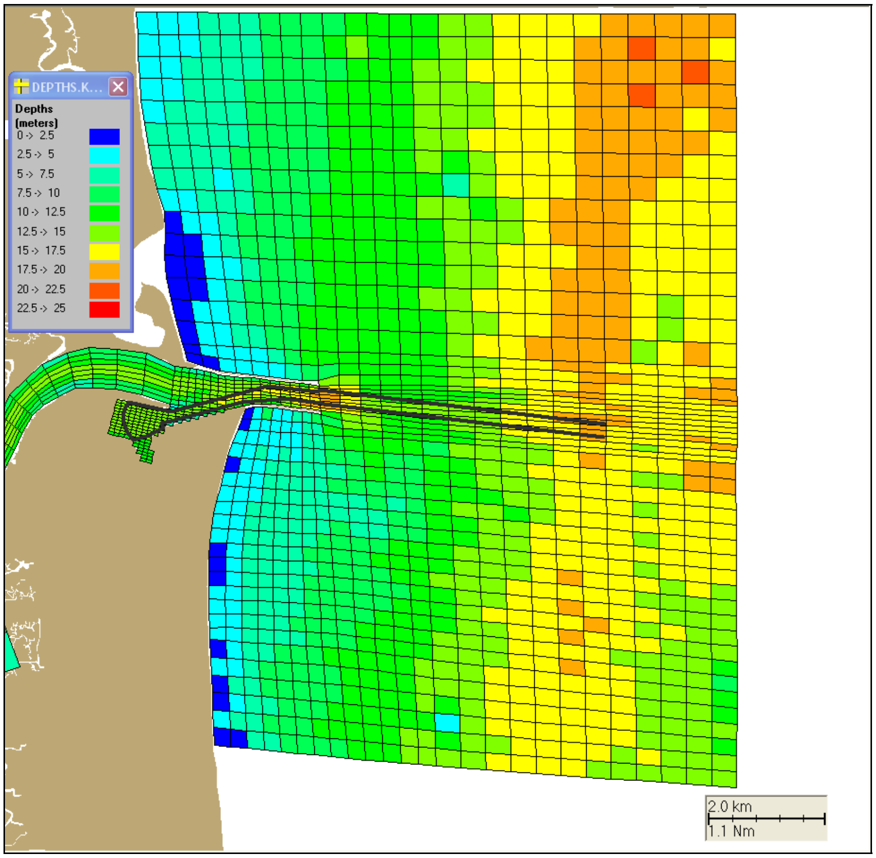


Figure 4.3-1 Detail of the Refined Grid Used by ASA to Study the Impacts of the Dredged Federal Channel in the St. Johns River

The hydrodynamic model simulations for the pre-dredged and post-dredged cases were run using the conditions described above. A series of points shown in Figure 4.3-2 were selected to represent the changes in currents, salinity, and sedimentation in the federal navigation channel, the NAVSTA Mayport entrance channel, and the NAVSTA Mayport turning basin. Changes in salinity further up the St. Johns River were also modeled. Impacts or changes in existing conditions were estimated for the extreme tidal conditions of maximum ebb and maximum flood tides. The ebb condition is the flowing back of the tide as the water returns to the ocean as opposed to the flood condition which reflects the rising tide of the ocean.

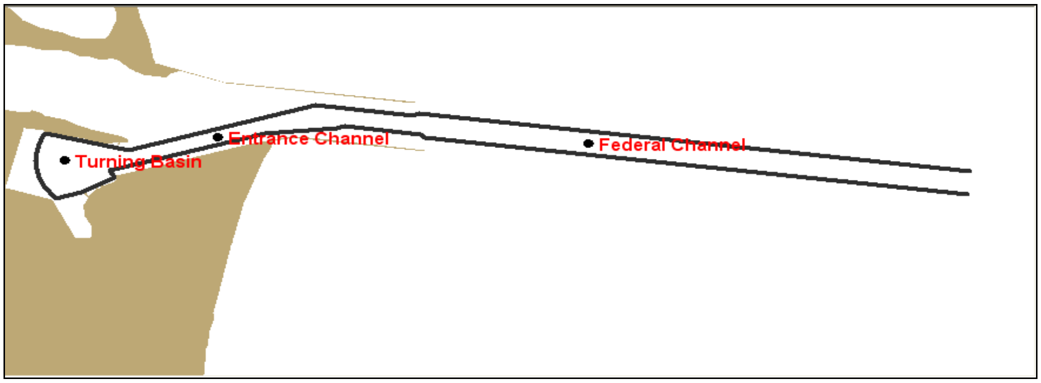


Figure 4.3-2 Representative Locations in NAVSTA Mayport Turning Basin, NAVSTA Mayport Entrance Channel, and Federal Navigation Channel for Hydrodynamic Modeling

Currents

The model provides comparisons (Table 4.3-1) of the vertical profile of current speeds at the federal navigation channel, NAVSTA Mayport entrance channel, and NAVSTA Mayport turning basin locations at maximum ebb and flood. The currents at the federal navigation channel location are highest of the three locations reflecting the tidal and freshwater flows in the main channel. The surface ebb currents are highest at 2.6 feet per second (ft/s) for both the pre- and post-dredged condition in the main navigation channel. The bottom ebb currents are slower, at 0.56 ft/s for the pre-dredged condition and 0.46 ft/s for the post-dredged condition. The difference in bottom current speeds is due purely to the increased depth as the vertical structure of the speeds between the two conditions. Otherwise, the bottom speeds for all of the ebb and flow tides are relatively similar for the pre- and post-dredge tidal conditions in all three locations of the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel. The surface flood currents in the federal navigation channel for both the pre- and post-dredge conditions are both less, at 0.89 ft/s compared to the surface ebb speeds due to the effects of the freshwater flow in the river. The bottom flood currents are somewhat smaller than the surface, at 0.56 ft/s for the pre-dredged condition and 0.59 ft/s for the post-dredged condition. This estimated change in currents between the pre- and post-dredged conditions would be minor.

Table 4.3-1 Surface and Bottom Current Speeds within the Dredging Areas

Location	Existing Condition Currents	Post Dredge Condition Currents
NAVSTA Mayport Turning Basin	Surface Ebb 0.10 ft/s Bottom Ebb 0 ft/s	Surface Ebb 0.03 ft/s Bottom Ebb 0 ft/s
	Surface Flood 0.33 ft/s Bottom Flood 0.6 ft/s	Surface Flood 0.36 ft/s Bottom Flood 0.6 ft/s
NAVSTA Mayport Entrance Channel	Surface Ebb 2.3 ft/s Bottom Ebb 0.26 ft/s	Surface Ebb 2.2 ft/s Bottom Ebb 0.23 ft/s
	Surface Flood 2.2 ft/s Bottom Flood 0.69 ft/s	Surface Flood 2.0 ft/s Bottom Flood 0.62 ft/s
Federal Navigation Channel	Surface Ebb 2.6 ft/s Bottom Ebb 0.56 ft/s	Surface Ebb 2.6 ft/s Bottom Ebb 0.46 ft/s
	Surface Flood 0.89 ft/s Bottom Flood 0.56 ft/s	Surface Flood 0.89 ft/s Bottom Flood 0.59 ft/s

The currents at the NAVSTA Mayport entrance channel location are much more symmetric between flood and ebb since the entrance channel location is not directly affected by the freshwater flow in the river. For the pre-dredged channel, the surface ebb current is approximately 2.3 ft/s and drops to 0.26 ft/s at the bottom. For the post-dredged channel, the surface ebb current is approximately 2.2 ft/s and the bottom current drops to 0.23 ft/s. For the pre-dredged channel, the surface flood current is approximately 2.2 ft/s and drops to 0.69 ft/s at the bottom. For the post-dredged channel, the surface flood current is approximately 2.0 ft/s and the bottom current drops to 0.62 ft/s. Again, the estimated change in currents between the pre- and post-dredged conditions would be minor.

In comparison to the federal navigation channel and NAVSTA Mayport entrance channel, the currents in the NAVSTA Mayport turning basin are very small in both the surface and bottom since the location is near the upstream end of a water body. For the pre-dredged turning basin, the surface ebb current is approximately 0.10 ft/s and drops to zero at the bottom. For the post-dredged turning basin, the surface ebb current is approximately 0.03 ft/s and the bottom current again drops to zero. For the pre-dredged turning basin, the surface flood current is approximately 0.33 ft/s and drops to 0.6 ft/s at the bottom. For the post-dredged turning basin, the surface flood current is approximately 0.36 ft/s and the bottom current again drops to 0.6 ft/s at the bottom. These estimated differences in currents between the pre-and post-dredged conditions would be minor. Furthermore, there would be no increased potential for shoreline erosion, particularly given that the protection provided by the existing jetties and armoring along the portion of the federal navigation channel and NAVSTA Mayport entrance channel to be dredged. Changes to channel bathymetry would be limited to those portions of Harbor Cut 3 to be dredged (see Figures 2.3-1, 2.3-2, and 2.3-3), which would not affect cross-sectional flow in a manner that would increase flow or flooding upriver.

Salinity

The hydrodynamic model was also used to estimate the changes in the vertical profile of salinity at the three referenced locations within the proposed deepening areas at maximum ebb and flood. Both the surface and bottom salinity were evaluated. Salinity at the river bottom (i.e., bottom salinity) is of concern and commonly measured for change because of the organisms that inhabit such benthic environments. As indicated in Table 4.3-2, predicted changes between the pre- and post-dredging conditions were found to be less than 0.5 percent. For the federal navigation channel location, the surface ebb salinities are 32.5 ppt for the pre-dredged condition and 32.4 ppt for the post-dredged condition. The bottom ebb salinities are slightly higher, at 33.8 ppt for both conditions. There is slightly higher stratification (freshwater/ocean water mixture) in the surface layers due to the freshwater flow in the river. The surface flood salinities are slightly higher, at 33.3 ppt for pre-dredged condition and 33.5 ppt for post-dredged condition, compared to the surface ebb salinities due to the effects of the freshwater flow in the river. The bottom flood salinities are higher than the surface, at 35.2 ppt for the pre-dredged condition and 35.1 ppt for the post-dredged condition. These estimated changes in salinities between the pre- and post-dredged conditions would be minor.

The comparative salinities at the NAVSTA Mayport entrance channel location are generally less than at the federal navigation channel location. For the pre-dredged channel, the surface ebb salinity is approximately 30.0 ppt and increases to 32.4 ppt at the bottom. For the post-dredged channel, the surface ebb salinity is approximately 29.8 ppt and the bottom salinity increases to 32.3 ppt. For the pre-dredged channel, the surface flood salinity is approximately 33.4 ppt and increases to 34.7 ppt at the bottom. For the post-dredged channel, the surface flood salinity is approximately 33.8 ppt and increases to 34.8 ppt at the bottom. Again, these estimated changes in salinities between the pre- and post-dredged conditions would not be substantial.

The existing salinities in the water of the NAVSTA Mayport turning basin are lower than those in the NAVSTA Mayport entrance channel location. For the pre-dredged turning basin, the surface ebb salinity is approximately 30.6 ppt and increases to 33.8 ppt at the bottom. For the post-dredged basin, the surface ebb salinity is approximately 30.9 ppt and the bottom salinity again increases to 33.8 ppt. For the pre-dredged basin, the surface flood salinity is approximately 30.2 ppt and increases to 33.6 ppt at the bottom. For the post-dredged basin, the surface flood salinity is approximately 30.0 ppt and the bottom salinity increases to 33.4 ppt at the bottom. These differences in salinities between the pre-and post-dredged conditions would be minor. As noted in Section 3.2.2.2, average salinities in the NAVSTA

Mayport turning basin range from 33 ppt during flood flow to 15 to 26 ppt during ebb flow, depending on tidal range and freshwater flow conditions (DoN 2000).

Table 4.3-2 Minimum and Maximum Surface and Bottom Salinity within the Dredging Areas

Location	Tide	Surface/Bottom	Existing Conditions	Post-Dredge Conditions	Change
NAVSTA Mayport Turning Basin	Ebb	Surface	30.6	30.9	+0.3
		Bottom	33.8	33.8	0.0
	Flood	Surface	30.2	30.0	-0.2
		Bottom	33.6	33.4	-0.2
NAVSTA Mayport Entrance Channel	Ebb	Surface	30.0	29.8	-0.2
		Bottom	32.4	32.3	-0.1
	Flood	Surface	33.4	33.8	+0.4
		Bottom	34.7	34.8	+0.1
Federal Navigation Channel	Ebb	Surface	32.5	32.4	-0.1
		Bottom	33.8	33.8	0.0
	Flood	Surface	33.3	33.5	+0.2
		Bottom	35.2	35.1	-0.1

Changes in salinity were evaluated relative to “mile 0” – the point where the proposed deepened NAVSTA Mayport entrance channel depth of -54 ft MLLW would meet the -42 ft MLLW federal navigation channel (i.e., the western edge of Jacksonville Harbor Bar Cut 3 Area 2; see Figure 2.3-1). The hydrodynamic model predicted a small decrease in salinity at the river bottom and a slight increase in salinity at the surface in the St. Johns River for river mile 0 to river mile 4 (from mile 0) during certain tide conditions. This predicted change in salinity is believed to be the result of the “sill” or ledge that would be created on the river bottom (by the deepening of the NAVSTA Mayport entrance channel where it meets the federal navigation channel [mile 0]). It is expected that this sill would impede intrusion of salinity at deeper (bottom) depths into the upper river under normal conditions.

Table 4.3-3 shows the existing and post-dredged bottom salinities in the federal navigation channel at high slack tidal conditions when the salinity intrudes furthest up the river for distances of up to 12 miles from river mile 0. Figure 4.3-3 provides a graphical representation of these small differences in salinity to approximately mile 23. Salinity modeling showed no change in salinity from about river mile 10 to mile 30 upriver.

Table 4.3-3 Prediction of Changes in Maximum Bottom Salinity Upriver of Proposed Deepening Project

Location	**Maximum Bottom Salinity**		
	Existing Condition (ppt)	**Post-Dredged Condition (ppt)**	**Change in Salinity (ppt)**
Mileage Eastward From Mile 0* towards the Atlantic Ocean			
3.74	35.29	35.28	-0.01
1.49	35.19	35.19	0.00
0.44	34.97	35.06	0.09
At Mile 0			
0.00	35.03	34.94	-0.09
Mileage Westward From Mile 0 and Upriver			
0.37	34.99	34.89	-0.10
1.68	34.67	34.54	-0.13
2.18	34.58	34.40	-0.18
2.62	34.47	34.25	-0.22
3.05	34.31	34.06	-0.25
3.49	34.08	33.81	-0.27
3.92	33.67	33.39	-0.28
4.36	33.05	32.79	-0.26
4.86	31.93	31.70	-0.23
5.36	30.64	30.47	-0.17
5.79	29.42	29.31	-0.11
6.23	28.25	28.19	-0.06
6.73	26.97	26.95	-0.02
7.16	25.62	25.62	0.00
7.54	24.49	24.50	0.01
8.91	21.54	21.54	0.00
11.02	16.41	16.43	0.02
12.21	13.14	13.17	0.03

**Note: Mile 0 is the point where the proposed deepened federal navigation channel depth of -54 ft MLLW would meet the -42 ft MLLW federal navigation channel (the western edge of Jacksonville Harbor Bar Cut 3 Area 2, see Figure 2.3-1).*

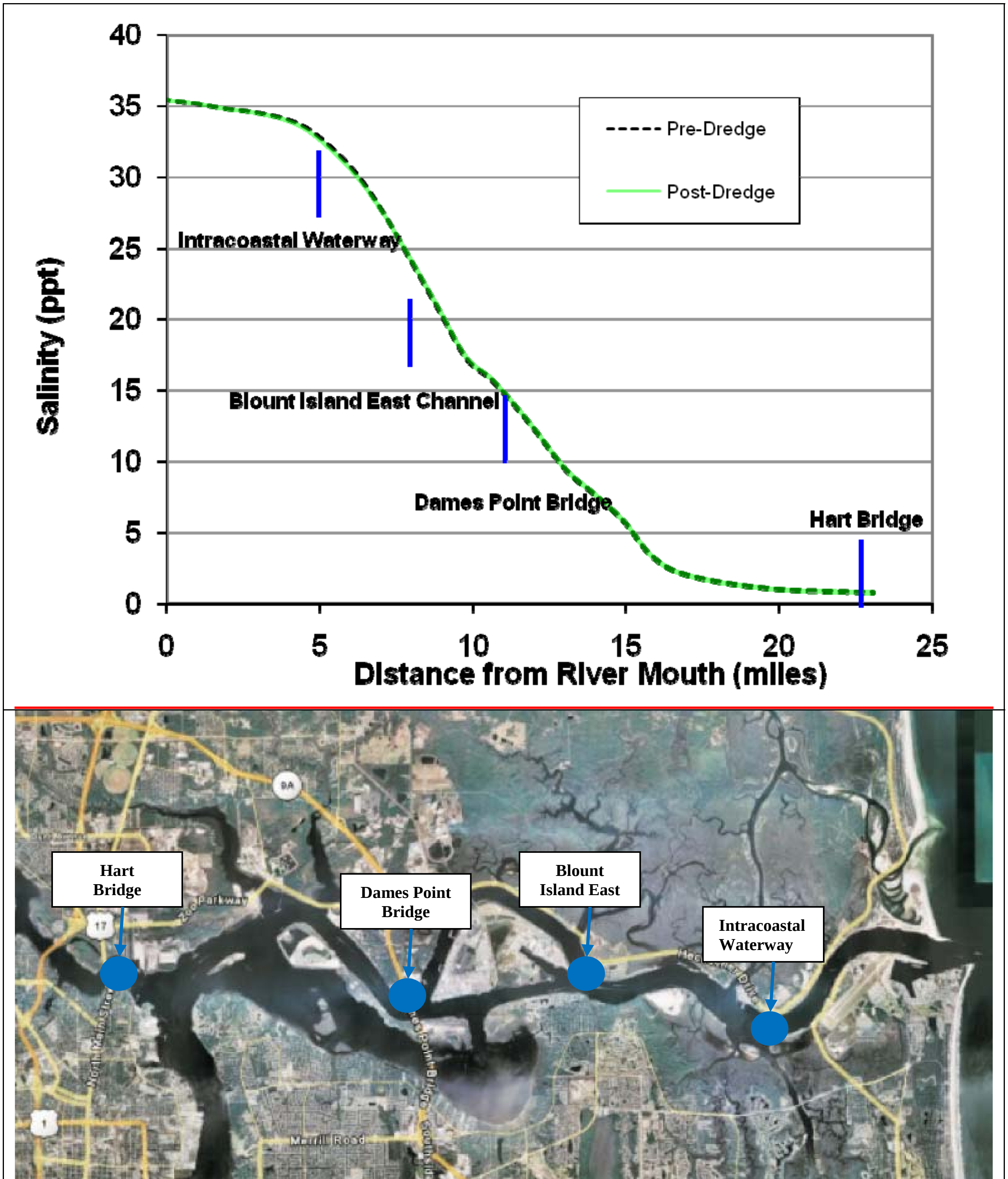


Figure 4.3-3 Maximum Pre- and Post-Dredged Bottom Salinities in the Lower St. Johns River during the Tidal Cycle

Model simulations showed that the maximum upstream extent of salinity intrusion in the St. Johns River would not change as a result of the proposed dredging project. During low river flow, the model predicted a less than 1 ppt decrease in bottom salinity and a less than 1 ppt increase in surface salinity in river mile 0 to river mile 4 during spring tides as a result of dredging. Salinity at mid-depth during spring tides and at all depths during spring tides was predicted not to change. During high river flow, the model predicted an approximately 1 ppt decrease in salinity at the bottom and mid-depth of the river and an approximately 1 ppt increase at the surface in river mile 0 to river mile 12 during a spring tide and an approximately 1-2 ppt decrease in salinity at the bottom and mid-depth of the river and an approximately 1-2 ppt increase at the surface from river mile 0 to river mile 8 during a neap tide as a result of the proposed dredging. Overall, the model results indicated that the proposed dredging project would result in minor changes in the salinity of the St. Johns River and these changes would be limited to the area of proposed dredging westward of mile 0 from two to approximately five miles upriver. These predicted changes would be insignificant when compared to the existing salinity levels in the river.

Sedimentation

The sediment transport model is incorporated into the EFDC hydrodynamic model, which transfers hydrodynamic transport information (i.e., current velocity, water depth, etc) to the sediment transport model. This modeling effort (used to analyze the effects of deepening the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigation channel to a total depth of -54 ft MLLW) was completed between the release of the DEIS to the public and the development of the FEIS (see Appendix A.5). However as indicated in Section 2.3.1.1, based on these hydrodynamic modeling results and historic USACE maintenance dredging information, only three areas of the proposed project have been identified as needing advance maintenance: (1) the NAVSTA Mayport entrance channel, (2) the federal navigation channel between stations 196+00 and 185+00, and (3) the federal navigation channel between stations 138+00 and 90+00 (see Figure 2.3-2). As a result, rather than uniformly implementing advance maintenance dredging for the entire project, the dredge project was modified to eliminate the additional 2 ft of advance maintenance dredging in areas other than those identified above. It was determined that this reduction of approximately 10 percent of the dredge volume that corresponded to uniform -54 ft MLLW total depth would not appreciably affect the results of the sediment transport model and, therefore, the model was not rerun and the results presented here are for the uniform -54 ft MLLW total depth. The complete hydrodynamic model study is included as Appendix A.5.

The sediment transport model used in this study has been developed and refined over the past 20 years and is capable of simulating erosion and deposition of sediment within cohesive (i.e., clays and silts) and non-cohesive (i.e., sands) bed (bottom) areas (Ziegler *et al*. 2000, Jones and Lick 2001). Whereas sedimentation in the NAVSTA Mayport turning basin is mainly due to the transport of suspended cohesive sediment, non-cohesive sediment transport processes occur in the NAVSTA Mayport entrance and federal navigation channels.

The model has the following general characteristics and capabilities:

- Three-dimensional transport of suspended sediment in the water column;
- Use of Sedflume core data to determine site-specific erosion rate parameters (Sedflume refers to a methodology for determining the gross erosion rates of sediments that can be fed into the sediment transport model);
- Spatially variable bed properties;
- Sediment bed model that tracks temporal changes in bed composition (i.e., sediment particle size, sediment source); and
- Bed load transport of sand.

Available Site-Specific Data and Information Used in the Model

The sediment bed in the NAVSTA Mayport turning basin is mainly composed of cohesive sediment (i.e., silts and clays) while the surface layer of the federal navigation channel is mainly sand. Calibration of the sediment transport model also requires input of the sedimentation rates of the study area. The overall annual sedimentation volume, used in the sediment transport modeling for the NAVSTA Mayport turning basin was based on historical dredging records compiled over a 34-year period from 1957 to 1987. These records showed that the annual volume of sediment deposited in the turning basin was approximately 321,000 cy per year. This deposition rate corresponds to a spatially-averaged sedimentation rate of 1.8 ft per year. This annual sedimentation rate was assumed for the NAVSTA Mayport entrance channel as no historical data were available.

Estimated annual sedimentation rate for the federal navigation channel was based on dredged volume over a three-year period for a portion of the federal navigation channel extending approximately 5.3 miles upstream from the mouth of the jetties (Ross 2007a). The resulting sedimentation rate used in the sediment transport model was 0.2 ft per year.

Sediment Transport Model Calibration Strategy

For modeling purposes, the areas to be dredged under this project can be separated into two distinct bed (bottom) types: Cohesive (i.e., silts and clays in the NAVSTA Mayport turning basin and entrance channel) and non-cohesive (i.e., mostly sandy sediment in the federal navigation channel). These two bed types led to the following strategy for calibrating the sediment transport model:

- Use of a one-year long calibration period to correspond to the hydrodynamic mode simulation.
- Simulating the suspended load transport of cohesive and non-cohesive sediment separately, treating the two different sediment classes (cohesive and non-cohesive) separately, and representing these two sediment classes by particle diameter, because the effective particle diameter of a sediment class affects the deposition and erosion characteristics of that class (e.g., large particles will deposit faster than small particles).
- Establishment of a calibration target for cohesive sediment transport at the 321,000 cy per year rate estimated from the 34-year historical dredging records. Initial testing of the model showed that this volume is proportional to the sediment load specified in the river upstream of the study area. Because no data are available on the sediment load in the river, this load was treated as a calibration parameter and the magnitude of the sediment load.
- For non-cohesive sediment transport, the calibration target was the estimated average sedimentation rate in the federal navigation channel (0.2 ft per year).

Boundary Conditions and Model Parameters

The effective particle diameters for the cohesive and non-cohesive sediment classes were estimated from available grain size distribution data. The NAVSTA turning basin and entrance channel beds consists primarily of cohesive sediments with an effective diameter of 20 µm. The sediment bed in the federal navigation channel is composed mainly of sands. However, the available data for this area provided only percentages of silt/clay and sand, which are insufficient for estimating effective particle size. Thus, the effective particle diameter for non-cohesive sediment was set at 150 µm, which is approximately the mid-range value of fine sand.

For this model analysis, it was assumed that the source of material that would be deposited in the dredged areas is exclusively coming from upstream sources in the river. Other possible sources of sediment transport into the study area include the open ocean and sediment bed outside the dredged areas. It is possible for sediment (primarily sand) to be transported from the open ocean into the river and study area. This transport process involves resuspension of sediment in the ocean by surface waves, followed by ocean currents transporting the resuspended sediment. However, the presence of the jetties at the mouth of the river significantly reduces the ability of this transport process to move sediment from the ocean to the study area. Thus, the impact of these sediment sources on sedimentation in the study area was considered to be negligible. The other potential sediment source, the existing sediment bed outside of the study area was discounted under the assumption that the bed elevation in the river is stable (i.e., in dynamic equilibrium) over multi-year periods and would not be a significant source of sediment to the study area on an annual basis.

The overall results of the sediment transport modeling for the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigation channel are shown in Table 4.3-4. The results indicate that dredging the area to a maximum of -54 MLLW would cause an overall increase in annual deposition volumes of two percent, seven percent, and two percent in sedimentation rates within the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigational channel, respectively. Even though the overall increase in deposition volume in the NAVSTA Mayport turning basin would only be two percent, there would be a spatial variability within the basin. The dredged area inside the NAVSTA Mayport turning basin is predicted to experience a decrease of about seven percent in the average sedimentation rate while the non-dredged areas (under this project – see Figure 2.3-2) would experience an increase of approximately 12 percent.

Table 4.3-4 Pre- and Post-Dredging Sediment Deposition Volumes

Area	Pre-Dredging Volume (cy per year)	Post-Dredging Volume (cy per year)	Relative Difference between Pre- and Post -Dredging
NAVSTA Mayport Turning Basin; Dredged Area	182,160	169,400	-7 %
NAVSTA Mayport Turning Basin: Non-Dredged Area	145,420	163,350	12 %
NAVSTA Mayport Turning Basin: Total	327,580	332,750	2 %
NAVSTA Mayport Entrance Channel	164,100	174,900	7 %
Federal Navigation Channel	195,250	198,660	2 %

When the uncertainty in model accuracy is considered, it is noted that the predicted overall change of 2 percent within the NAVSTA Mayport turning basin may not be exact, but corresponds to a minimal overall change in the basin. Therefore, it was concluded that the primary effect of dredging is on spatial distribution, and not on sediment quantity in the NAVSTA Mayport turning basin.

The predicted increase in sedimentation rate in the NAVSTA Mayport entrance channel is due to the presence of the channel at an angle to the main flow in the river. Increasing the depth of this channel by approximately 12 ft would cause a significant decrease in the local velocities within the NAVSTA Mayport entrance channel. Lower current velocities in the NAVSTA Mayport entrance channel increases the probability of deposition, which would result in an increase in the sedimentation rate.

As explained by Headland (1991), and predicted by the model, there is a significant density-driven current that is transporting sediments into and throughout the NAVSTA Mayport turning basin. This density driven current is caused by the relative density of freshwater and saltwater and layering of heavier saltwater at the bottom. Dredging the NAVSTA Mayport turning basin would increase the level of salinity-stratification in the water column (as the saltwater layers would comprise a greater percentage of the NAVSTA Mayport turning basin volume), which would cause density-driven currents to increase in strength (relative to the pre-dredging condition). Higher near-bed velocities would result in a lower probability of deposition, which would produce less sedimentation in the dredged area of the NAVSTA Mayport turning basin. The sediments not deposited in the dredged areas of the NAVSTA Mayport turning basin would travel further inside the basin reaching the non-dredged areas. Therefore, more sediment would be available to be deposited in the non-dredged areas increasing the sedimentation rate relative to the pre-dredging condition.

For the post-dredging conditions, the predicted average sedimentation rate in the non-cohesive bed areas of the federal navigational channel is 0.3 ft per year compared to the pre-dredge condition of 0.2 ft per year. However, the spatial variability of the sedimentation rate is relatively high in this area and the non-cohesive sediment simulation also has more uncertainty associated with it than the cohesive sediment simulation for the following reasons:

- The sedimentation rate is based only on anecdotal information.
- The spatial distribution of historical maintenance dredging in the federal navigational channel is not known from the available information, which covers a much larger area than the study area.
- Data on the spatial variability of bed properties was not available.

Therefore, the results of the non-cohesive sediment simulations have only been used to estimate the relative effects of dredging on the sedimentation rates.

Short Term Effects of Dredging Activities

Temporary physical impairment of the water column, resulting from dredging, occurs from short term changes in DO, salinity, pH, and turbidity with a resultant decrease in light penetration. The degree of change or alteration of the water column's physical components depends on various physical and chemical parameters of the sediment (e.g., pH, oxidation/reduction potential, sediment size, organic matter content, concentration of reactive iron and manganese, etc.) as well as the dredging method being used.

The water column near the proposed dredging would experience temporary physical impairment due to an increase in Total Suspended Solids (TSS) during dredging operations. Disturbance of the sediment may also result in the release of dissolved hydrogen sulfides into the water column resulting in a concurrent decrease in DO. However, it is unlikely that dredging activities would release enough nutrients or dissolved hydrogen sulfide to produce low DO levels in the St. Johns River estuary. The State Class III water quality standard for DO levels in predominantly marine zones is that these waters shall not average less than 5.0 mg/l in a 24-hour period and shall never be less than 4 mg/l, with a minimum daily average of 5 mg/l. However, FDEP and SJRWMD have established the following site specific alternative criteria for DO for the estuarine portions of the Lower St. Johns River: (1) a minimum DO concentration of 4.0 mg/l and (2) total fractional exposure to DO levels in the 4.0 to 5.0 mg/l range must also be at or below 1.0 for each annual evaluation period as determined by an equation where the number of days within each interval is based on the daily average DO concentration. The "total fractional exposure" level, according to USEPA, is the concentration of DO that protects both larval recruitment and growth for aquatic organisms.

Dissolved organic and inorganic pollutants in the environment may become adsorbed to sediment particles and many pollutants, such as hydrophobic organics (e.g., PCBs) and some inorganics, have a tendency to remain strongly adsorbed to sediments even after mechanical resuspension into the water column as a result of dredging activities.

The resuspension and dispersion of sediment during dredging operations has been measured by the USACE for various dredging methods to determine the potential for release of strongly adsorbed chemicals into the water column (USACE 1988). According to the USACE, the release of hydrophobic (strongly adsorbed) chemicals can be evaluated by examining the transport of resuspended sediments. Results of the USACE study indicate that the TSS levels from clamshell dredging are an order of magnitude higher than from hydraulic cutterhead dredging of similar sediments. Also, clamshell dredging distributed sediment throughout the water column, whereas the plume from cutterhead dredging remained in the lower part of the water column. Hopper dredging with overflow resulted in high levels of TSS throughout the water column with concentrations more than an order of magnitude higher than for hopper/drag arm dredging without overflow. As a result, the USACE has determined that the cutterhead dredge is a logical selection for controlling sediment resuspension while maintaining efficient production. In applications where a cutterhead dredge is not practical (i.e., for work in open seas with significant wave heights (over 3 ft) when a hopper/drag arm dredge would be preferred, or around docks and other harbor installations where a clamshell dredge would be preferred), sediment resuspension from clamshell and hopper dredges can be controlled through techniques of the dredging operation. Sediment resuspension from clamshell dredges can be controlled, sometimes at the expense of dredge production, through careful operation, such as reducing the speed at which the crane lowers an empty bucket through the water column to pick up a load of sediment, and the rate at which the full bucket is lifted through the water column to remove the excavated material. Limiting the practice of smoothing the excavated area by dragging the bucket along the bottom may also reduce sediment resuspension at the point of dredging. Additionally, limiting overflow from hopper/drag arm dredging showed significant benefits by reducing water column TSS levels to near background levels compared to the water quality conditions during hopper overflow (USACE 1988).

The temporary impacts to the water column associated with the increase in turbidity from dredging would cease following completion of dredging activities. Tidal forces, the grain size fractions of the material being dredged, and the method of dredging (e.g., clamshell vs. hydraulic dredge) all affect the horizontal and vertical extent of elevated TSS concentrations that may occur as a result of the proposed action. The sediments to be dredged from the project area for Group 2 alternatives include sand, silt, clay and gravel fractions. Extremely fine materials such as silt and clay have a tendency to go quickly into suspension during the dredging process. Since the fall velocity of such fine particles is very small, these particles remain in suspension for a longer time compared to coarse-grained particles that settle fairly quickly. The degree of turbidity and the length of the sediment plume are largely dependent on the size of the sediment particles and the water flow velocity (Herbich 2000). As discussed in a Navy study, *An Engineering Evaluation of Fine Sedimentation at the Mayport Naval Basin*, the total hydraulic exchange rate in the turning basin is dominated by density current exchange which drastically increases the rate of water exchange in the basin (NAVFAC undated). Various scenarios addressing these factors were considered when evaluating characteristic increases in TSS in the water column as a result of dredging. Given the physical characteristics of the sediment in the project with more silt in the NAVSTA Mayport turning basin as compared to sediments with more sand and clay in the NAVSTA Mayport entrance channel and federal navigation channel, there would be more relative turbidity in the confines of the turning basin than in the St. Johns River and ocean portions of the proposed project area. During dredging activities, turbidity curtains could potentially be used, where practical, if the State requirement of 29 nephelometric turbidity units (NTUs) is exceeded at a distance greater than 150 meters (492 ft) from the dredging operations. Additionally the Navy would apply for necessary permits, and adhere to all requirements, including any mitigation measures. As a result, impacts of dredging are short term and temporary in nature and are not considered significant.

To illustrate the spatial extent of the dispersion of suspended dredged sediment during the action of dredging, a standard computer model was used. The Suspended Sediment Fate (SSFATE) model provides data on the project specific short-term effects of dredging. SSFATE simulations were completed to determine the suspended sediment concentrations and sediment deposits resulting from proposed dredging activities in the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and the federal navigation channel; and water column concentrations of three contaminants found in sediments inside the NAVSTA Mayport turning basin.

Two points were selected for modeling: one within the center of the NAVSTA Mayport Turning Basin and one within Bar Cut 3 of the federal navigation channel. As indicated in Table 4.3-5, the SSFATE model inputs included using a clamshell dredge at the NAVSTA Mayport turning basin location and a hopper dredge in the federal navigation channel location. Table 4.3-6 lists the dredged sediment grain size distribution used in the SSFATE model at the two locations. These data were derived from the sediment sample collection and analysis undertaken for this EIS.

Table 4.3-5 Dredge Methods, Dredge Production Rates, and Sediment Loss Rates Used in the SSFATE Modeling

	Dredge Method	Production (cy/hour)	Released (%)
NAVSTA Mayport Turning Basin	Clamshell	1,375	4
Federal Navigation Channel	Hopper	2,100	1

Table 4.3-6 Sediment Grain Size Distribution Used in the SSFATE Modeling

	Sediment Composition (%)				
	Clay	**Fine Silt**	**Coarse Silt**	**Fine Sand**	**Coarse Sand**
NAVSTA Mayport Turning Basin	40.4	23.4	23.4	6.4	6.4
Federal Navigation Channel	22.67	6.78	6.78	31.88	31.88

Sediment is suspended in the surrounding water during dredging with a clamshell type dredge in a number of ways. Sediment being dredged is suspended when: (1) the clamshell strikes the seabed, closes and is withdrawn; (2) sediment escapes into the water column from inside the bucket, and; (3) sediment that has adhered to the sides of the bucket falls away as it is lifted from the water. A series of field studies and calculations have been performed to quantify the amount of sediment that is suspended in the water column from clamshell and other dredging methods. The amount of sediment introduced to the water column during clamshell dredging depends on the sediment type, the time required to fill and empty the bucket, and the distance the bucket travels through the water during one fill and empty cycle.

Estimates of the rate of sediment loss from a bucket dredge to the surrounding water are typically based on measurements of turbidity or suspended sediment concentration in the vicinity of operating dredges and various schemes to extrapolate source rates from these measurements. A survey of the literature provides a range of sediment loss estimates for bucket dredges (Table 4.3-7).

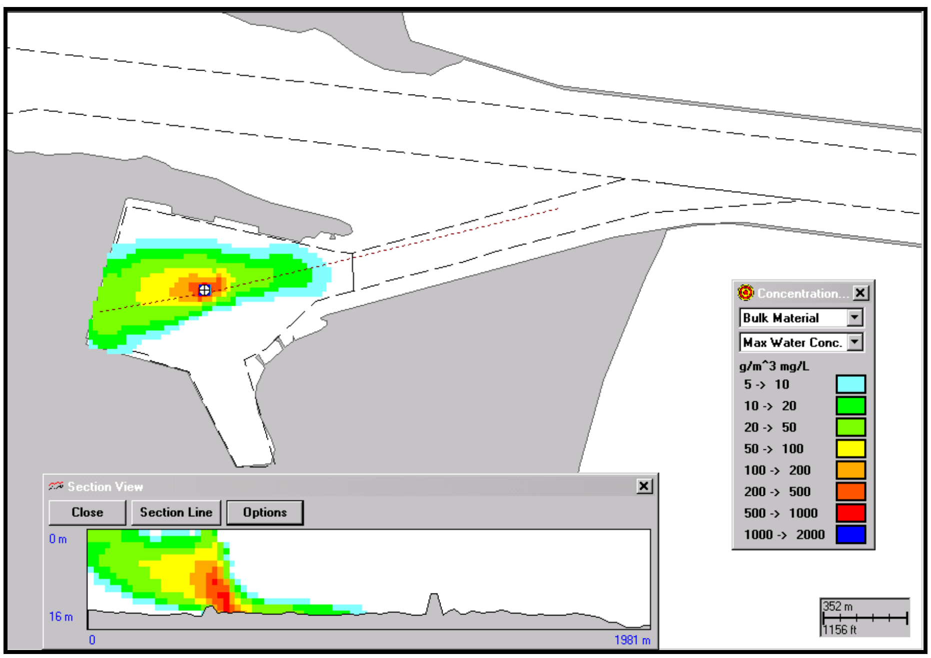
Table 4.3-7 Estimates of Sediment Loss Rates from Bucket Dredge Operations

Reference	**Sediment Loss Rate (percent)**
Bohlen 1979	1.5 and 3.0
Anchor Environmental 2003	2.1
Pennekamp *et al.* 1996	6.14
Burt *et al.* 2006	6
Land *et al.* 2006	5.4 and 9.6

The high loss rate (9.6 percent) of Land *et al.* 2006 was reportedly due to large quantities of debris in the dredged sediment causing failure of bucket closure and large sediment losses during dredging. When this high loss rate is discounted, the average of the remaining loss rates is 4.02 percent. Therefore, for the purposes of this EIS analysis, it was estimated that 4 percent of the estimated production rate with the clamshell bucket would become suspended sediment into waters in the proposed dredge project area.

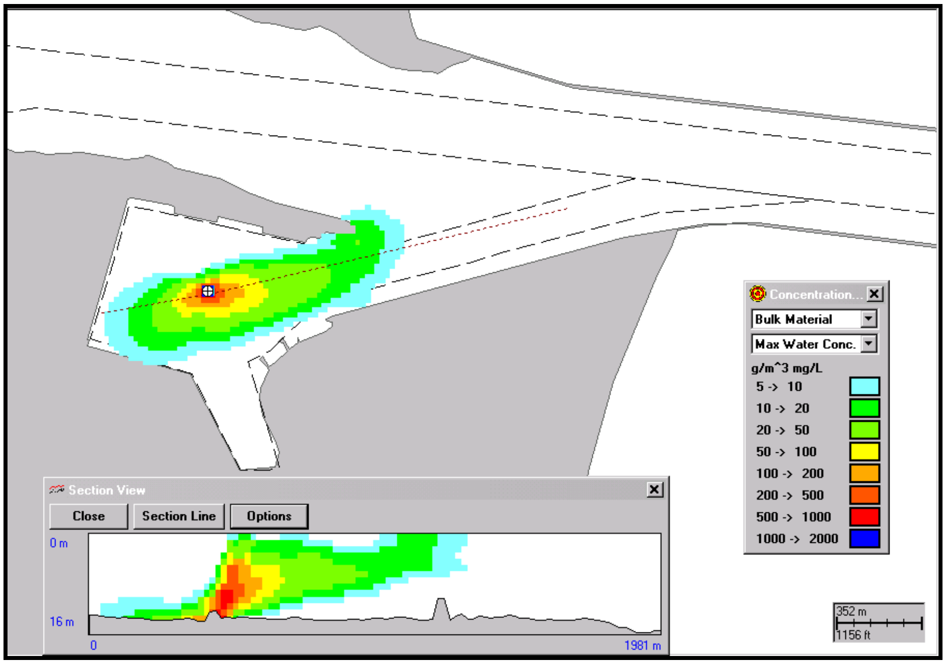
The estimated release of sediment using a hopper dredge that has hydraulic equipment with a cutterhead is estimated to be one percent of the production rate. This estimate is derived from a formula developed by Hayes and Wu (2001) to estimate the mass of sediment introduced into the water column by the dredging operation as a fraction of the sediment being dredged. Based on field studies of cutterhead dredging operations, the estimate of the mass of sediment introduced into the water column by the dredging operation ranged from 0 to 0.51 percent of the sediment being dredged (Hayes and Wu 2001). Thus, the one percent loss rate used for the SSFATE simulations of dredging in the federal navigation channel represents a conservative estimate.

Figures 4.3-4, 4.3-5, and 4.3-6 are plan and cross-section views of the SSFATE predicted suspended sediment concentration resulting from clamshell dredging of the NAVSTA Mayport turning basin.



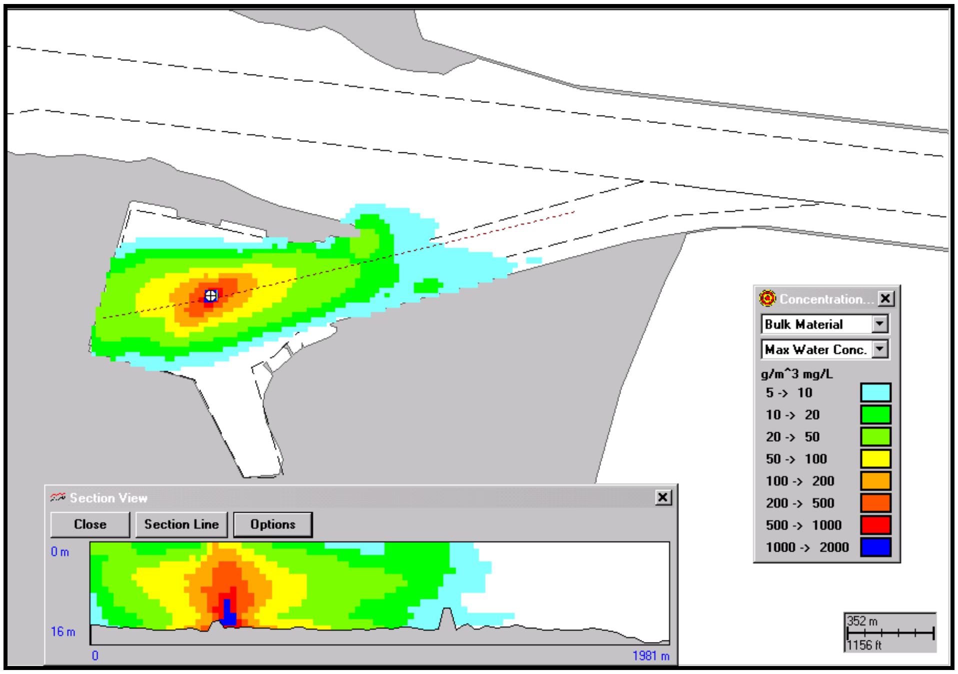
Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-4 Water Column Sediment Concentration during Flood Stage of the Tide from Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin



Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-5 Water Column Sediment Concentration during Ebb Stage of the Tide from Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin



Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-6 Maximum Water Column Sediment Concentration throughout Tidal Stages Resulting from Clamshell Dredging Activities in the NAVSTA Mayport Turning Basin

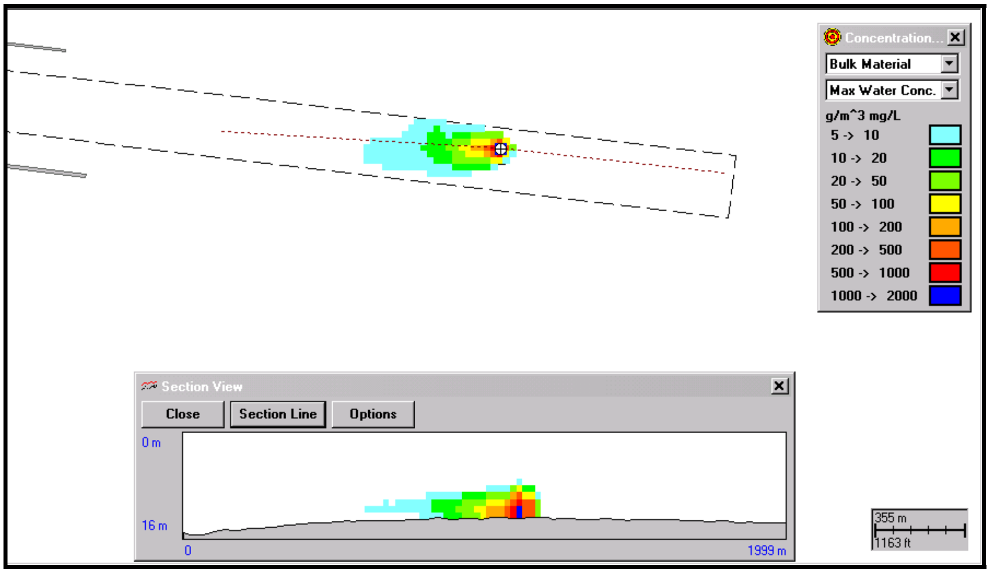
As illustrated above in Figures 4.3-4, 4.3-5, and 4.3-6, the dispersion of the released sediment from the dredging action would result in a short term elevation in suspended sediment. The SSFATE model estimates the direction and distance from the point of dredging and the effects of dilution as the suspended sediment settles through the water column. As depicted in the plan view, the model predicts that the concentration of suspended sediment would be greatest near the point of dredging and would dissipate with distance and direction of the tidal cycle. Overall, the elevated concentrations of suspended sediments would remain within the NAVSTA Mayport turning basin and entrance channel from this illustrated central point in the turning basin. Table 4.3-8 lists the area of suspended sediment concentration around the dredge for a range of concentrations from 5 to 5,000 mg/l that are predicted to result from clamshell dredging of the NAVSTA Mayport turning basin. Following the conclusion of clamshell dredging activities within the NAVSTA Mayport turning basin, it is estimated that all related suspended sediment would totally dissipate within four hours.

Table 4.3-8 Extent of Sediment Concentrations in the Water Column throughout Tidal Stages due to Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin

Water Column Sediment Concentration (mg/l)	**Area Coverage (**acres)
5 to 10	46
10 to 20	36
20 to50	43
50 to 100	18
100 to 200	8
200 to 500	4
500 to 1,000	1
1,000 to 2,000	0.3
2,000 +	0.1

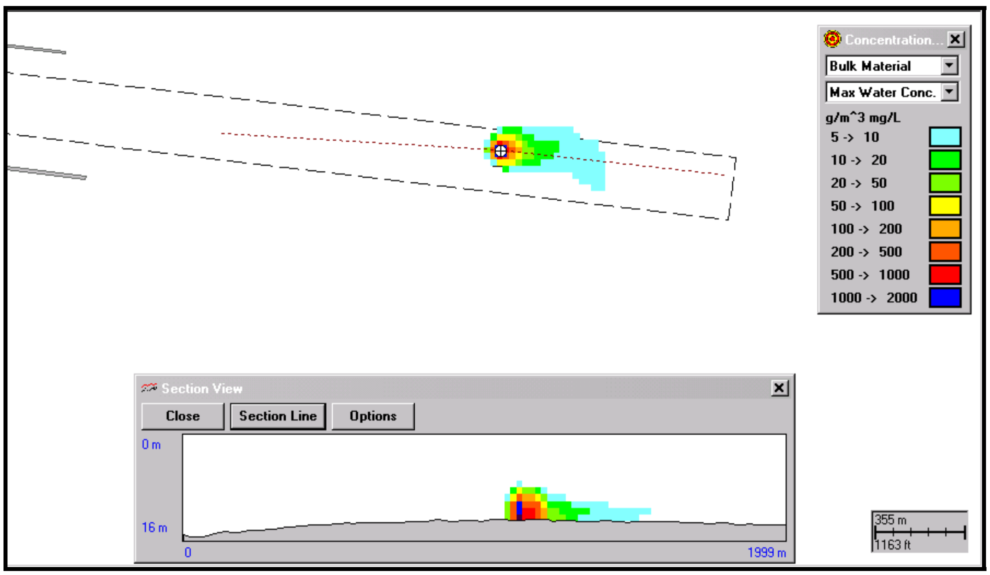
Note: The area coverage is the plan view extent of the suspended sediment plume at the indicated concentration range through a tidal cycle.

Figures 4.3-7, 4.3-8 and 4.3-9 below are plan and cross-section views of the SSFATE predicted suspended sediment concentration resulting from hopper dredging of the federal navigation channel. Based on the modeling results, dredging action within the federal navigation channel would create suspended sediment that would remain mainly within the linear confines of the channel. Sediment to be dredged from the federal navigation channel contains heavier sediment types than in the NAVSTA Mayport turning basin and, as such, any releases would sink to the seafloor more readily.



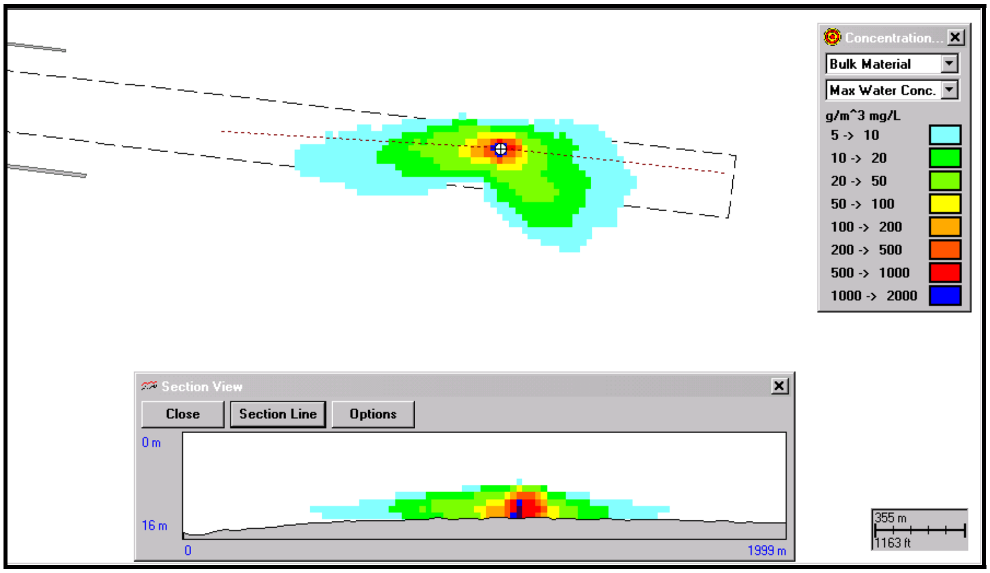
Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-7 Water Column Sediment Concentration during Flood Stage of the Tide from Hopper Dredging Activity in the Federal Navigation Channel



Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-8 Water Column Sediment Concentration during Ebb Stage of the Tide from Hopper Dredging Activity in the Federal Navigation Channel



Note: Colors depict the maximum suspended sediment concentration in the water column, in both plan and cross-section views.

Figure 4.3-9 Maximum Water Column Sediment Concentration throughout Tidal Stages Resulting from Hopper Dredging Activities in the Federal Navigation Channel

Table 4.3-9 lists the area of suspended sediment concentration around the dredge for a range of concentrations from 5 to 5,000 mg/l that are predicted to result from hopper dredging activities in the federal navigation channel. The SSFATE model estimates that, following the conclusion of hopper dredging in the federal navigation channel, all related suspended sediment would totally dissipate within one hour.

Table 4.3-9 Extent of Sediment Concentrations in the Water Column throughout Tidal Stages due to Hopper Dredging Activity in the Federal Navigation Channel

Water Column Sediment Concentration (mg/l)	**Area Coverage** (acres)
5 to 10	51
10 to 20	27
20 to 50	15
50 to 100	3
100 to 200	1.7
200 to 500	1.5
500 to 1,000	0.5
1,000 -to 2,000	0.3
2,000 +	0.2

Note: The area coverage is the plan view extent of the suspended sediment plume at the indicated concentration range through a tidal cycle.

Dredging - Chemical Effects on Water Resources/Quality

As an unavoidable result of the transient suspended sediment plume from dredging operations in the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and federal navigation channel of the St. Johns River; a portion of the chemical burdens in the sediment would be released into the water column. The impacts of dissolved chemical releases at the point of dredging is evaluated by conducting elutriate testing to assess contaminant releases in the more biologically available water phase. As part of evaluations conducted in support of DEIS, elutriate testing was performed on one sample collected as a grab sample of the upper 6 inches of sediment in the NAVSTA Mayport turning basin (see Figure 3.1-5 and Appendix A.3). The "elutriate" fraction of the test is that water fraction with any water-soluble contaminants that remains after the result of mixing samples of surficial sediment with site water and centrifuging. If there are contaminants in the sediments to be dredged, the elutriate test is designed to replicate this release in the laboratory. The elutriate tested for the proposed project showed no detections of pesticides, PAHs, or PCBs. There were seven dissolved metals that were detected in the dredge elutriate. The concentrations of these metals have been compared to Florida water quality standards per FAC 62-302. Most of the detected metals above the reporting limits were well below the state water quality standards for Class III waters. However, arsenic exceeded the water quality standards with a measured 131 micrograms per liter (µg/l) compared to 50 µg/l Class III water quality standards. Similarly, dissolved mercury and lead in the dredge elutriate exceeded Class III standards for marine waters. Mercury was measured in the elutriate sample at 30 µg/l compared to a 0.025 µg/l state standard while lead measured 26 µg/l compared to the 8.5 µg/l state standard. Given the relatively large difference in the elutriate mercury reading from the state standard and the fact that only a single sample was taken in the NAVSTA Mayport turning basin, additional elutriate tests were performed at this location after publication of the DEIS.

This additional elutriate testing was conducted as part of the more intensive, and site specific MPRSA Section 103 Evaluation of the sediment to be dredged. These samples and elutriate testing will be used in dispersion modeling at the ODMDS to be conducted during the permitting phase. In spring 2008, samples from the dredge project area in the NAVSTA Mayport turning basin and entrance channel and federal navigation channel seaward of NAVSTA Mayport were collected and further analyzed for metals, PCBs, pesticides, and PAHs as part of the Section 103 Evaluation of dredged materials. Sediment samples were collected from the same location where the elutriate test was performed for the DEIS as a core sample of the full dredge depth rather than as a grab sample of the upper six inches of sediment. A control sample was taken for comparative purposes at a location approximately 8 miles offshore of

NAVSTA Mayport. All of the samples within the sediments within the dredge project area were found to be well below the Florida Class III surface water quality standards (Ross 2008b). Specifically:

- Trace amounts of PCB congeners were detected in elutriates from all dredge project area samples, but none were higher than the control sample and all were well below the Florida Class III marine surface water quality standard of 0.03 µg/l (Ross 2008b).

- Arsenic and nickel were detected in all dredge project area samples and the control sample. However, all levels were well below the Florida Class III marine surface water quality standard of 50 ug/l for arsenic and 8.3 µg/l for nickel (Ross 2008b).

- Mercury was not detected in any dredge project area samples at levels above the required method detection limit of 0.2 µg/l. This detection limit is below the USEPA federally recommended marine water quality criteria of 1.8 µg/l for acute exposure and 0.94 µg/l for chronic exposure, but above the Florida Class III marine water standard of 0.025 µg/l. Mercury was detected in the control sample (8 miles offshore NAVSTA Mayport) at a level well below the USEPA federally recommended marine water quality criteria of 0.94 µg/l for chronic exposure, but above the Florida Class III marine water quality standard of 0.025 µg/l. Given that the required method detection limit of 0.2µg/l is above the Florida Class III marine water quality standard of 0.025 µg/l, there is a potential for violation of the Florida Class III marine water quality standard for mercury at the dredging site absent an allowable mixing zone. Due to the low levels involved, it is highly likely that any mercury present would disperse and be below the Class III marine water quality standard within the allowed 150-meter mixing zone. To confirm this, during the permitting phase, a dilution model will be run to determine the probable concentration of mercury at the boundary of the mixing zone assuming the initial value is one half the detection limit (Ross 2008a, 2008b, and USEPA 2008e).

- Pesticides and PAHs were below detection levels in all dredge project area samples and the control sample (Ross 2008b).

These results suggest that the exceedance of Florida Class III surface water quality standards for arsenic, mercury, and lead in the sample collected for the DEIS analysis were an anomaly. It is important to note that the elutriate test analyzes a mixture of sediment and water that basically reflects the temporary effects of re-suspended sediment during dredging and ocean disposal. With clamshell bucket dredging that is anticipated to be used within the NAVSTA Mayport turning basin, sediment is disturbed at the point of dredging on the bottom in addition to a small amount of spillage that typically occurs as the bucket is raised out of the water before the dredged material is placed within the scow. For ocean disposal, a bottom dumping scow would be used to place the material at the ODMDS. The elutriate test results, in this case, reflect the dissolved chemical concentrations associated with the dredged material that are released as the material transcends through the water column to the ODMDS. Following the completion of dredging or disposal, the sediment and water mixture would settle out and water quality would return to normal within a short period of time and within a close proximity of the dredging and/or ocean disposal activities. Considering the short-term nature of the dredging activities and relatively low levels of most contaminants in the sediment that would be resuspended, the impacts to water quality under Group 2 alternatives are considered minor and temporary.

Based on the results of the single elutriate sample evaluated in the DEIS, the SSFATE model was used to illustrate the spatial extent that dissolved arsenic, lead, and mercury would disperse from the point of the dredging action. The results of this SSFATE modeling are not indicative of the more intensive Section 103 testing, where these metals were not found above detection limits.. However, because the results of the SSFATE were published in the DEIS, they are retained in this FEIS. As previously noted, given that the required method detection limit of 0.2µg/l is above the Florida Class III marine water quality standard, a dilution model will be run during the permitting phase to determine the probable concentration of mercury at the boundary of the mixing zone assuming the initial value is one half the detection limit.

The same assumptions previously described for suspended sediment for use of a clamshell bucket dredge in the NAVSTA Mayport turning basin were used for this modeling effort. Figures 4.3-10, 4.3-11, and 4.3-12 show plan and cross-section views of the SSFATE predicted arsenic, lead, and mercury concentrations in the water column (respectively) resulting from clamshell dredging of the NAVSTA Mayport turning basin. Concentrations are shown in µg/l and are the maximum value predicted. The results illustrate that the concentrations of mercury and lead in the water column from the sediment released during dredging would disperse within a short distance of the dredging action. Given the higher relative concentrations of arsenic, the dispersion would extend further within the NAVSTA Mayport turning basin and the fringes of the NAVSTA Mayport entrance channel at relatively low concentration (most of the dispersion would be at levels ranging 0.1 to 0.5 µg/l as compared to the 50 µg/l Class III water quality standard for arsenic).

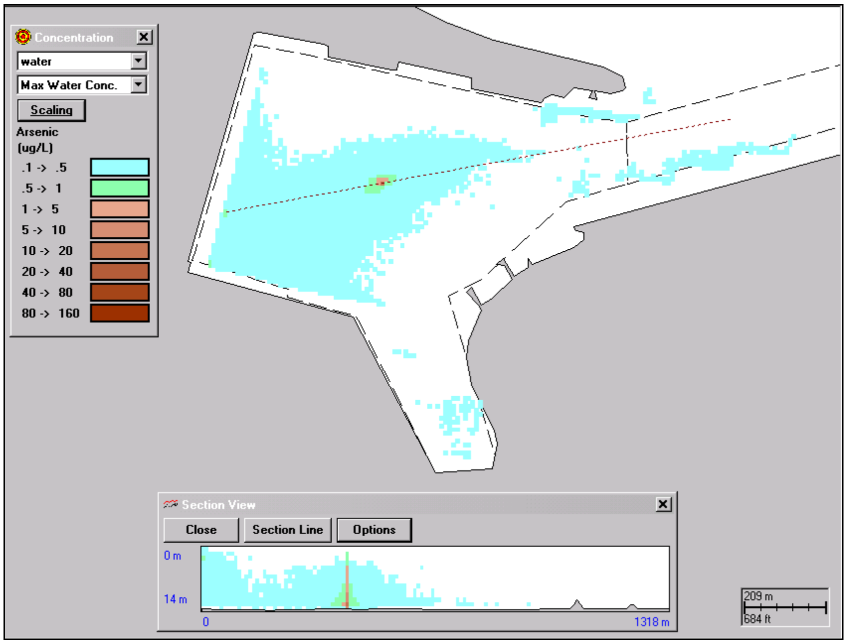


Figure 4.3-10 Maximum Water Column Concentration of Arsenic Induced by Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin

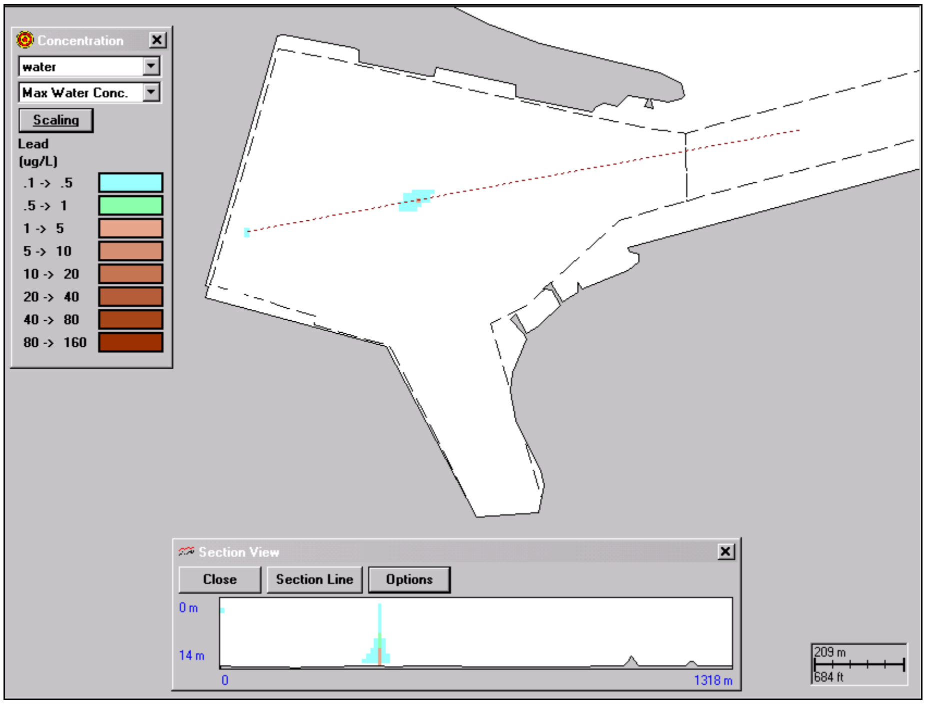


Figure 4.3-11 Maximum Water Column Concentration of Lead Induced by Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin

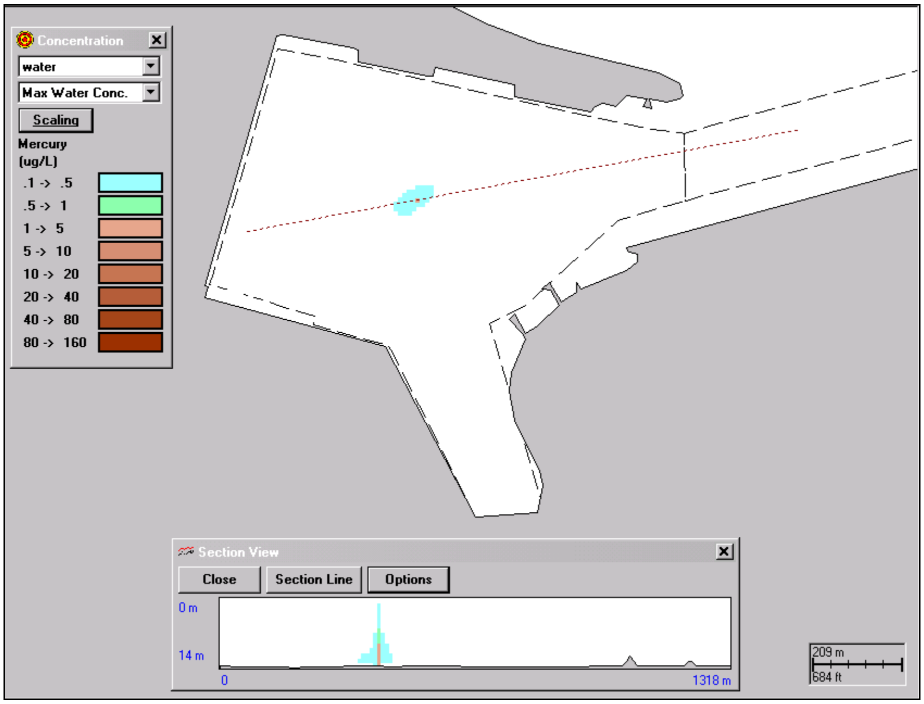


Figure 4.3-12 Maximum Water Column Concentration of Mercury Induced by Clamshell Dredging Activity in the NAVSTA Mayport Turning Basin

<u>Ocean Disposal - Physical Effects on Water Resources/Quality</u>

Dredged material likely would be disposed of in one or both of the USEPA-managed Jacksonville or Fernandina ODMDSs. Bottom-dumping hopper dredges or bottom-dumping barges would transit from the dredging site to the disposal location within the ODMDS and release dredged material for disposal on the ocean floor. Only dredged material meeting the MPRSA Section 103 rules for ocean disposal would be deposited at the ODMDS. Materials not meeting the rules would be disposed of in an existing, approved upland disposal site.

There are a number of physical water quality effects resulting from ocean disposal of dredged material. These effects include turbidity or elevated suspended material concentration during dumping from a bottom dumping barge or hopper, resuspension of sediments by currents, and a change in dredged sediment characteristics (size distribution or sorting coefficient) versus adjacent unaffected areas. These effects have been extensively researched at ocean disposal sites in the U.S.

The extent of suspended material concentration increase during and after barge or hopper dumping at ocean disposal sites has been studied by a transmissometer. NOAA has demonstrated that the suspended material concentrations returned to ambient levels in both surface and near-bottom waters in as little as one hour (DoN 2004a). Similar trends are expected for the disposal of the dredged material for this project. The possibility of resuspension of dumped sediments has also been studied at open water disposal sites as part of the Disposal Area Monitoring System (DAMOS) undertaken by USACE (SAIC 1980, 1989 in DoN 2004a). Generally, these studies have found that ocean disposal mounds sited within depositional areas at proper depth were quite stable even during storm events. Therefore, impacts of turbidity during disposal activities at the ODMDSs would be localized, short-term, and discountable.

<u>Ocean Disposal – Chemical Effects on Water Resources/Water Quality</u>

The Short-Term Fate of dredged material disposal in open water (STFATE) model is used to evaluate dissolved contaminant concentrations in the water column resulting from the disposal of dredged sediment from barges and hopper dredges. The model can determine the potential for water column impacts by comparison of predicted dissolved contaminant concentrations, as determined by an elutriate test, with the applicable water quality standards, considering the effects of mixing with ambient waters. The results of STFATE simulations are the maximum dissolved concentration of a contaminant within a defined mixing zone over a four hour period. This concentration is compared to the water quality standard to determine if the discharge complies with water quality guidelines.

The STFATE model was developed and is maintained by the USACE Engineer Research and Development Center. STFATE is a module of the Automated Dredging and Disposal Alternatives Management System (ADDAMS). The use of the STFATE model to depict impacts to water quality during dredged material disposal is a requirement stipulated by USEPA Region 4 in the 2007 SMMP for use of the Jacksonville ODMDS (USEPA and USACE 2007).

The behavior of the dredge material during disposal is assumed to be separated into three phases: convective descent, during which the disposal cloud falls under the influence of gravity and its initial momentum is imparted by gravity; dynamic collapse, occurring when the descending cloud either impacts the bottom or arrives at a level of neutral buoyancy where descent is retarded and horizontal spreading dominates; and passive transport-dispersion, commencing when the material transport and spreading are determined more by ambient currents and turbulence than by the dynamics of the disposal operation.

STFATE simulations were completed at the Jacksonville and Fernandina Beach ODMDSs using three contaminants identified in the project specific elutriate testing as possibly in violation of USEPA federal water quality standards (Table 4.3-10). The elutriate concentrations were determined from samples taken from sediment core N-21 recovered from the entrance to the Mayport turning basin (March 2007). The sediment physical characteristics used in the STFATE model simulations are the average of the top 2 samples in core N-21 which represent the sediment proposed to be dredged from the basin and entrance channel. The sediment is 62 percent silt, 33 percent clay, and 5 percent sand.

Table 4.3-10 Contaminants used in the STFATE Model Simulations

Contaminant	Elutriate Concentration	Background Concentration	USEPA Water Quality Standard
Arsenic	131 µg/L	1.36 µg/L	69 µg/L
Lead	25.8 µg/L	0.5 µg/L	210 µg/L
Mercury	30.3 µg/L	0.1 µg/L	1.8 µg/L

The STFATE input parameters used in this analysis were, with one exception, those specified in Appendix A of the 2007 Jacksonville ODMDS SMMP (USEPA and USACE 2007). The parameters used include all of the model coefficients, the current speed and direction, background concentration, and specification of the mixing zone. Initial STFATE simulations were run using all of the input values listed in the SMMP Appendix A, including a 350 ft grid cell dimension. The final STFATE model simulations used a 200 ft grid cell size after multiple model runs determined that this cell size results in a more consistent contaminant dilution than the larger cell size.

STFATE model simulations were run for Tier II analysis to evaluate the mixing of dissolved arsenic, lead, and mercury contained in barge volumes of 4,000 cy released at the Jacksonville or Fernandina Beach ODMDS. The maximum concentration over a four hour period of each of the three contaminants was plotted (Figures 4.3-13 through 4.3-18, below). The top of the curve for concentration levels reflects the predicted concentration 15 minutes after release of the dredged material into the water column. The results show that none of the contaminants exceed USEPA federal water quality standards at either of the ODMDSs after four hours or at any time outside the boundary of the respective ODMDS. The chemical effects on water quality at either ODMDS are thus considered short term and minor.

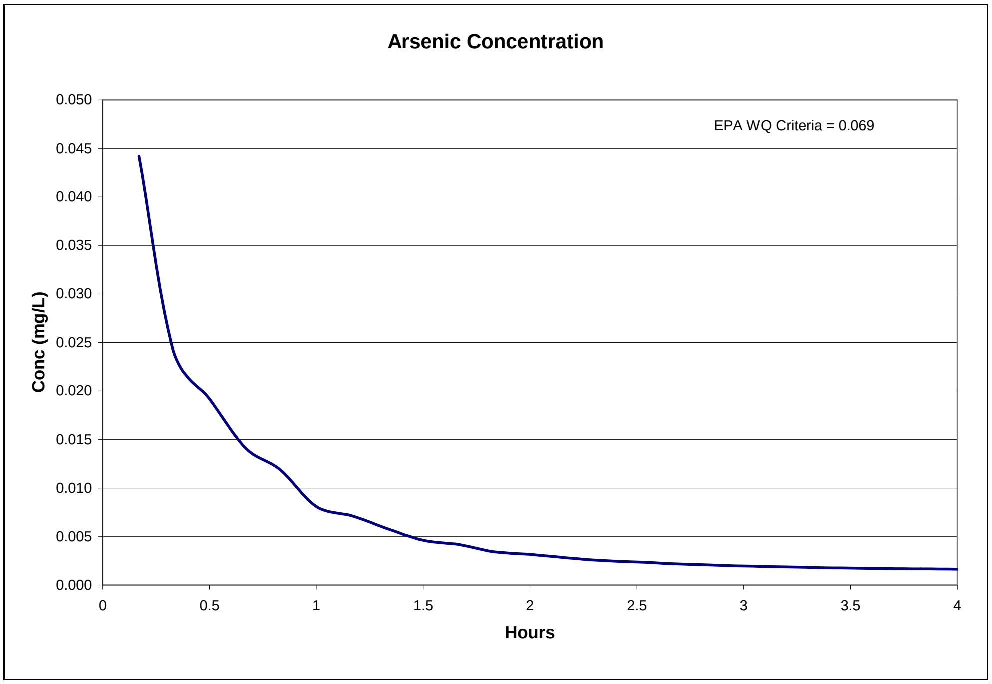


Figure 4.3-13 STFATE Predictions of Arsenic Concentration at the Jacksonville ODMDS

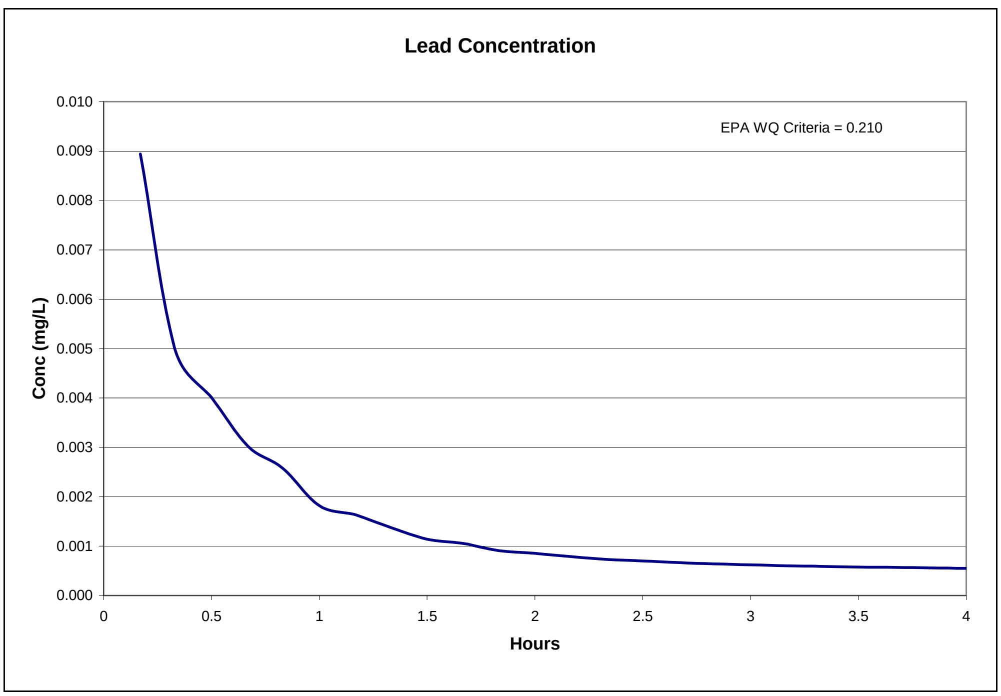


Figure 4.3-14 STFATE Predictions of Lead Concentration at the Jacksonville ODMDS

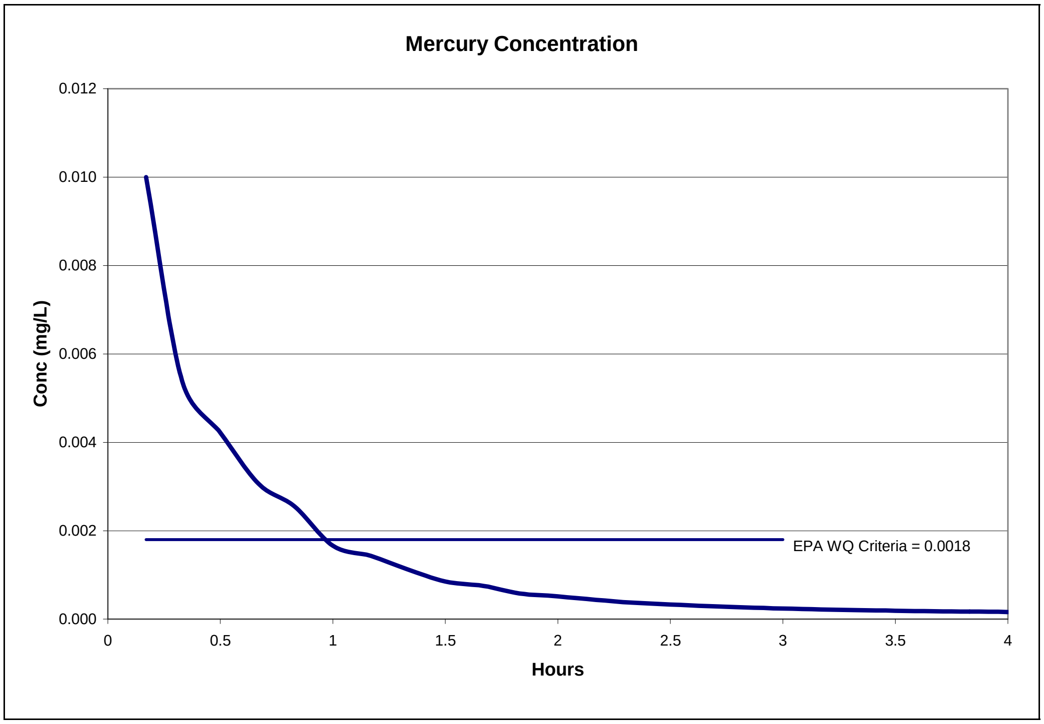


Figure 4.3-15 STFATE Predictions of Mercury Concentration at the Jacksonville ODMDS

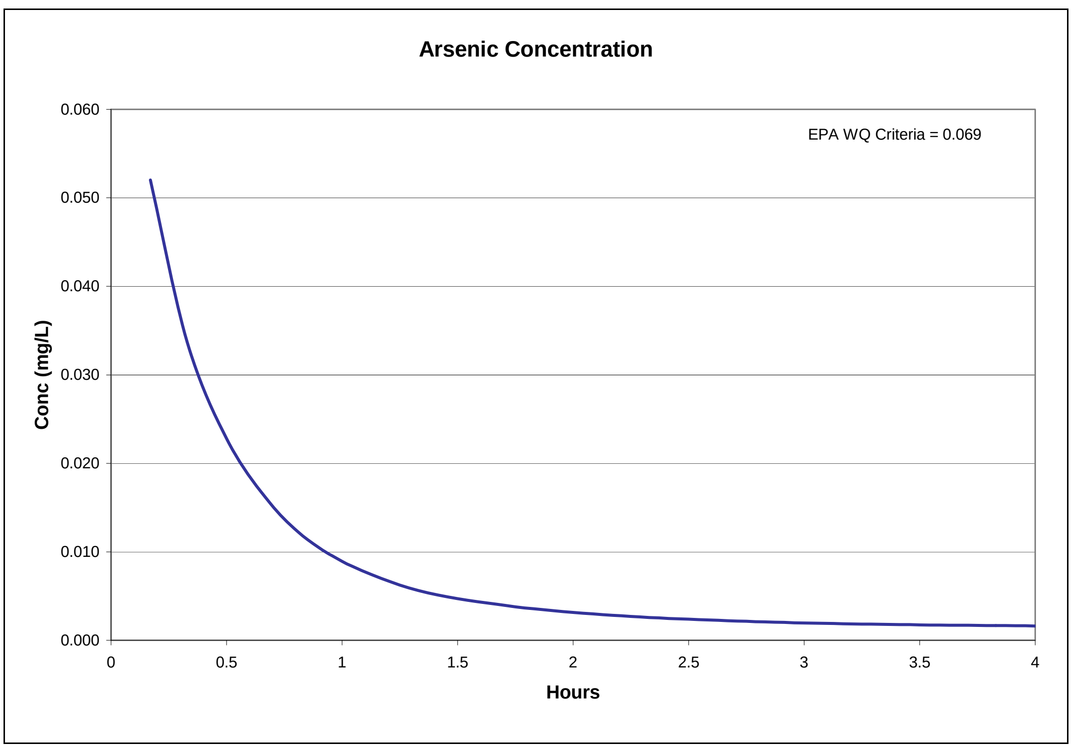


Figure 4.3-16 STFATE Prediction of Arsenic Concentration at the Fernandina Beach ODMDS

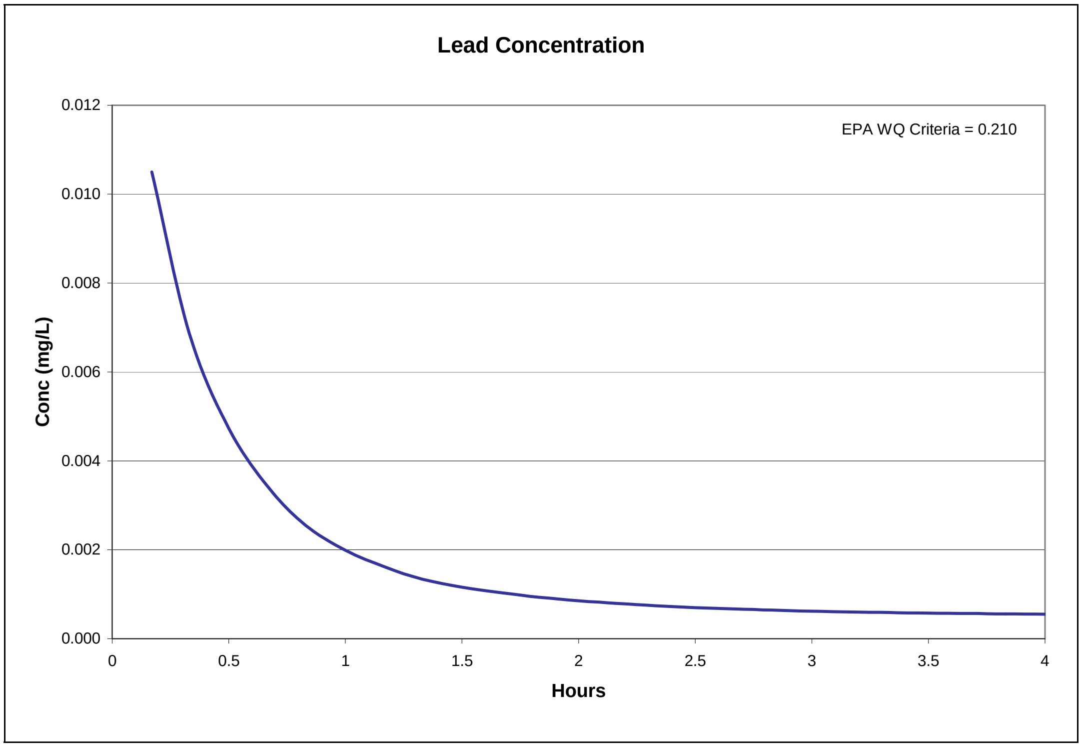


Figure 4.3-17 STFATE Prediction of Lead Concentration at the Fernandina Beach ODMDS

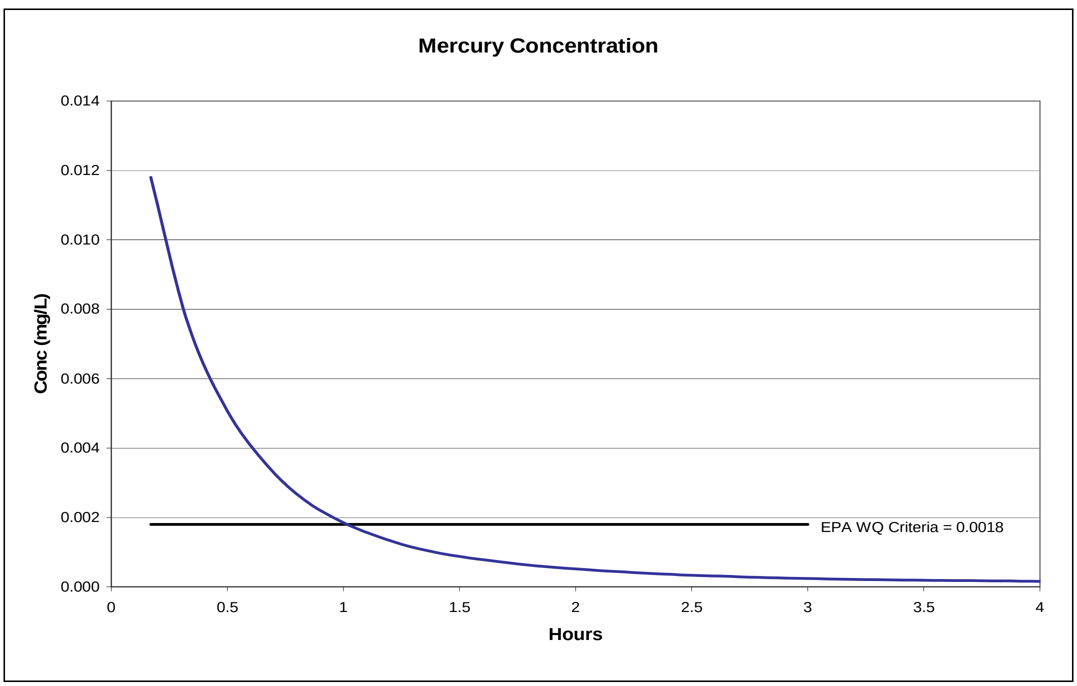


Figure 4.3-18 STFATE Prediction of Mercury Concentration at the Fernandina Beach ODMDS

Upland Disposal – Effects on Water Resources/Water Quality

The majority, if not all, of the dredged material would be disposed of in an USEPA-managed ODMDS (2 million cy to Jacksonville ODMDS and 3.2 million cy to Fernandina ODMDS). The placement of material at an upland disposal site would only be necessary for any volume of material that does not meet MPRSA section 103 rules for ocean disposal (see Section 3.1.5.1). If any upland disposal were to occur, only existing approved sites would be used; therefore, local impacts to water resources are not anticipated. Established upland sites possess various institutional and engineered controls designed to monitor and protect surface water quality established by site-specific FDEP Environmental Resource Permits and NPDES construction permits. These controls include but are not limited to: membranes and liners (e.g., if dike materials are too porous and/or sandy or if contaminated materials are disposed of at the site); settling ponds and stilling basins; water treatment systems (e.g., gravity flow weir systems); and effluent discharge limitations to meet state water quality standards specified under permit requirements (Hollingsworth 2007). The upland disposal of dredged material may result in small localized changes in stormwater runoff flow depending on the final topography of the disposal site. These small localized changes are unlikely to affect the final receiving waters of the stormwater flows, as stormwater flows that currently empty into the St. Johns River would continue to empty into the St. Johns River, and are not considered significant.

4.3.2.3 Wetlands and Floodplains

The proposed site for the DESRON headquarters facilities (Alternatives 7 and 11) would not be located within a FEMA floodplain or wetland area and no other Group 2 alternatives would result in direct or indirect development. The wetland areas on the southern bank of the entrance channel would not be impacted by proposed dredging in the area. Therefore, there would be no impacts to wetlands or floodplains under Group 2 alternatives.

4.3.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

4.3.3.1 Groundwater

All Group 3 alternatives propose CVN homeporting. This involves approximately 30 to 32 acres of ground disturbance for construction of facilities and improvements to support CVN homeporting, including construction of CVN nuclear propulsion plant maintenance facilities, parking structures, and traffic improvements. Construction would be upland primarily in the vicinity of Wharf F and along Massey Avenue for various road improvements. As previously described construction of these facilities would not breach the Floridan aquifer. Construction of CVN nuclear propulsion plant maintenance facilities, parking structures, and traffic improvements would occur in areas that are already paved with impervious surfaces, with the exception of areas required for Massey Avenue widening and intersection improvements. These traffic improvements would affect approximately 12 acres, approximately half of which may be impervious. As discussed in Section 4.11.3, stormwater controls would be implemented to address increases in impervious surfaces. Such controls would likely include detention or retention basins that would allow for recharge to the aquifer systems. Groundwater from the surficial aquifer may be encountered during site preparation activities (i.e., grading and excavation), but potential impacts would be addressed with adherence to construction NPDES permit requirements, dewatering practices, and modified construction techniques. Therefore, upland construction activities under Group 3 alternatives would not adversely affect groundwater.

Group 3 alternatives also propose the same dredging project as proposed for Group 2 alternatives and would have the same impacts. As previously discussed in Section 4.3.2, dredging to deepen the NAVSTA Mayport turning basin, entrance channel, and federal navigation channel to a maximum of -54 ft MLLW would not breach the Floridan aquifer and would not significantly impact ground water in the vicinity.

4.3.3.2 Surface Waters

The approximately 30 to 32 acres of ground disturbance proposed under Group 3 alternatives for construction of facilities and improvements to support CVN homeporting would not directly impact the St. Johns River or other surface waters with implementation of mitigation measures. In order to comply with regulations on TMDLs issued in December 2007, new impervious discharge would be addressed during site design and mitigation implemented to prevent additional nutrients from entering receiving waters. Stormwater runoff controls during the construction phase and long-term stormwater controls as discussed in Section 4.11.3 would be implemented to treat and remove nutrients from stormwater before it enters or to prevent it from reaching nearby receiving waters. These measures would include implementing the SWPPP during construction, upgrading existing stormwater control systems, and obtaining a Construction Generic Permit for new construction and an Environmental Resource Permit for Stormwater Management Systems. No new stormwater outfalls would be needed. As a result, there would be no significant impacts on surface waters in the vicinity. With the new industrial activity at the nuclear propulsion maintenance facilities, the NAVSTA Mayport SWPPP would need to be modified. The MS4 maintenance plans and goals may need to be modified to address new impervious surface activities. Because TMDLs would be connected to the MS4 permit, any modifications to the goals affecting how allocations would be accomplished may need to be submitted to FDEP for approval (Dombrosky 2007).

Group 3 alternatives also propose the same dredging project as proposed for Group 2 alternatives and would have the same impacts. As previously discussed in Section 4.3.2 there would be no significant impacts on surface waters from dredging or dredged material disposal.

4.3.3.3 Wetlands and Floodplains

Wetlands impacts under the Group 3 alternatives would be as described for Group 2 alternatives. However, the intersection improvements at Massey Avenue and Bon Homme Richard Street abut a drainage ditch that empties into a palustrine, forested, broad-leaved deciduous wetland area at the golf course (see Figure 3.3-1). During the design phase for these intersection improvements, impacts to these wetland areas likely could be avoided. If the design cannot avoid impact to these wetlands, the impact would be mitigated in accordance with all applicable regulations and permits.

The northern portion of the area of proposed development for the CVN nuclear propulsion maintenance facilities and portions of the Massey Road widening nearest the destroyer slip of the turning basin are nearest the FEMA 100-year floodplain. Facilities would be designed and constructed above the 100-year floodplain level. Therefore, there would not be any significant impacts to floodplains.

4.3.4 No Action Alternative (Alternative 13)

4.3.4.1 Groundwater

Under the No Action Alternative, the status quo at NAVSTA Mayport would be maintained and there would be no impact to groundwater.

4.3.4.2 Surface Waters

Under the No Action Alternative, the status quo at NAVSTA Mayport would be maintained and there would be no impact to surface waters.

4.3.4.3 Wetlands and Floodplains

The No Action Alternative would not result in any direct or indirect development; therefore there would be no impact to wetlands or floodplains.

4.3.5 Mitigation Measures

Under Group 1 and 2 alternatives, construction activities would disturb less than one acre. Based on current design plans, an Environmental Resource Permit for Stormwater Management would be required and associated erosion and sediment control measures implemented. New impervious discharge would be addressed during site design and mitigation implemented to prevent additional nutrients from entering receiving waters. Under the Group 3 alternatives, disturbance of 30 to 32 acres would require issuance of a Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems. Construction would occur within the requirements of these regulations and permits. With the new industrial activity at the nuclear propulsion plant maintenance facilities, the NAVSTA Mayport SWPPP would need to be modified. The MS4 management plans and goals may require modification with the new impervious surface activities. Because TMDLs would be connected to the MS4 permit, any modifications to the plans and goals affecting how allocations would be accomplished may need to be submitted to FDEP for approval (Dombrosky 2007).

Under Group 2 and Group 3 alternatives, the project would cause temporary increases in turbidity at the point of dredging and during material disposal at the ODMDS. The Navy would obtain and comply with all required permits and conditions prior to dredging, including a CWA Section 401 State Water Certificate and an Environmental Resources Permit from FDEP, and a Rivers and Harbors Act Section 10 permit and a CWA Section 404 permit from USACE. The State of Florida water quality regulations require that water quality standards not be violated during dredging operations. The standards require that turbidity outside the mixing zone shall not exceed 29 NTUs above background at a distance of 150 meters (492 ft). Various protective measures and monitoring programs would be conducted during construction to ensure compliance with State water quality standards. Should turbidity exceed State water quality standards during construction as determined by monitoring, the contractor would be required to cease operations until conditions return to normal. In accordance with MPRSA Section 103 requirements, the Navy is performing appropriate chemical and biological testing of dredged material during the permitting process as required by USACE and USEPA to verify the suitability for ocean disposal at a USEPA-managed ODMDS.

Under Group 3 alternatives, Massey Avenue road improvements would be designed to avoid wetlands. If the design cannot avoid impact to these wetlands, the impact would be mitigated in accordance with all applicable regulations.

4.4 AIR QUALITY

Significance Thresholds and General Conformity Determination Requirements

Air emissions resulting from the 12 action alternatives and No Action Alternative were evaluated in accordance with federal, state, and local air pollution standards and regulations. Temporary increases in air pollution concentrations associated with the construction phases of the alternatives are compared to the most recent available emission inventory for Duval County in order to assess significance.

Air quality in Duval County and the surrounding area, including Nassau County (the jurisdiction located closest to the Fernandina ODMDS), is regulated and enforced by the FDEP. The City of Jacksonville Office of Environmental Resource Management, Air Quality Branch, performs most state air pollution source permitting functions in Duval County. Additionally, the Jacksonville Environmental Protection Board (JEPB) has adopted local air pollution rules as part of the City's Ordinances. These rules pertain to specific, local requirements such as emissions from ships and locomotives in Duval County.

The increase in emission levels due to the action alternatives were calculated as part of the air quality analysis and in accordance with 40 CFR 1508.8, which requires analysis of direct and indirect impacts on the environment that are associated with the proposed action. Because some of the proposed action alternatives involve disposal of dredge materials at offshore locations (Jacksonville and Fernandina ODMDSs), air emissions associated with the transport of the dredge material to the offshore locations were included in the analysis. These air emissions are indirect effects based on the distance of the ODMDS from the location of the action (NAVSTA Mayport vicinity).

According to USEPA General Conformity Rule (40 CFR Part 51, Subpart W), any proposed federal action that has the potential to cause violations in a NAAQS maintenance area must undergo a conformity analysis. A conformity analysis is not required if the proposed action occurs within an attainment area. Per 40 CFR 93, Subpart B, compliance with the General Conformity Rule is presumed if the emissions associated with a federal action are below the relevant *de minimis* thresholds during a given year. Duval County is designated by USEPA as being in attainment for all current criteria pollutant standards. Although the SIP is outdated and still identifies the county as a Maintenance Area for ozone based on previous noncompliance with the former 1-hour ozone standard, the USEPA only considers the new 8-hour standard as being relevant to current air quality designation. Therefore, Duval County is in attainment with the current 8-hour ozone standard. Furthermore, Duval County has not violated the 1-hour ozone standard since prior to 1990. In addition, Nassau County and the surrounding areas have always been categorized as attainment for all criteria pollutants.

Conformity requirements are not needed in what were once designated as 1-hour maintenance areas unless they were classified as nonattainment for the 8-hour rule. Eight-hour ozone nonattainment and maintenance areas must continue to meet the requirements of the General Conformity regulations for the 8-hour ozone standard. Duval County is in attainment for the 8-hour ozone standard, thus a formal conformity determination is not required for project emissions. The emissions analysis contained herein is designed to evaluate the direct and indirect emission impacts in accordance with NEPA guidelines.

On 12 March 2008, USEPA changed the 8-hour ozone standard from 0.08 ppm to 0.075 ppm. Based on 2005-2007 data, Duval County's ozone compliance values are greater than 0.075 ppm. In order to implement the new standard, Florida's SIP will be modified to address reduction of ozone concentrations to levels in compliance with the standard. Florida has until 12 March 2009 to recommend to USEPA which areas of the state should be designated nonattainment for the new 8-hour ozone standard. The USEPA then has one year (by 12 March 2010) to make the final decision on nonattainment areas. This final decision will be based on the most recent data, and ozone levels could be reduced from the 2005-2007 levels based on programs currently in place to reduce ozone levels (FDEP 2008).

Analytical Methods

The analysis calculated estimated changes in air emissions at NAVSTA Mayport as a result of implementing the alternatives (see Appendix D). Construction and demolition emission sources associated with the alternatives/groups of alternatives were assessed, including mobile emission sources associated with dredging and disposal of dredged materials under the Group 2 and 3 alternatives,. On-base vehicle travel by construction personnel was also evaluated. Commuter emissions were assessed for Group 3 Alternatives 10 and 12; the only alternatives that would result in the same or increased net daily population at NAVSTA Mayport (see Table 2.1-2).

The alternatives primarily evaluate consequences of ships homeporting at NAVSTA Mayport. Because Duval County is in attainment with all NAAQS, NAVSTA Mayport is not required to monitor mobile emissions, including homeported ships, and the Station's Title V permit does not include ships or other mobile emission sources. Electrical shore power is used to power ships and their systems once they are in port; emission levels in port are a small fraction of operational emissions when ships are underway. As detailed in Table 2.1-2, all alternatives would result in a reduction in the total number of number of ships homeported at NAVSTA Mayport in the 2014 end state as compared to the 22 homeported ships in the 2006 baseline (which includes the conventionally powered KENNEDY). The number of ships homeported in 2014 ranges from 11 ships under Alternative 3 and the No Action Alternative to 18 ships under Alternative 12. Because the number of homeported ships would decrease, the overall number and horsepower (HP) of power plants that generate air emissions as a part of ship operations would decrease under all alternatives. As a result of the decommissioning of the conventionally powered KENNEDY in 2007, there has been a significant reduction in ship operational emissions.

Because the ship's power plant serves as the primary source of fuel combustion, it can be used for comparative purposes to evaluate air emission reductions based on the number of ships homeported under the alternatives. Table 4.4-1 provides a comparison of homeported ships and power plant HP decreases associated with the 2006 baseline as compared to the No Action Alternative, Group 2 Alternative 3, and Group 3 Alternative 12 2014 end state. Ships emissions under Group 1 alternatives with the highest number of homeported ships (Alternative 6, at 17 ships) would be essentially the same as Group 3 Alternative 12. The only difference between these alternatives in terms of homeported ships is the CVN included in Alternative 12 and this ship does not increase total plant HP for NAVSTA Mayport. The distinction between Group 2 Alternative 3 and the No Action Alternative is that under Alternative 3 a CVN may visit NAVSTA Mayport for up to 63 days per year, with no single visit lasting greater than 21 days (approximately 3 visits per year).

As indicated in Table 4.4-1, total power plant HP for ships homeported at NAVSTA Mayport in the 2006 baseline year was 1.52 million. The No Action Alternative and Alternative 3 would provide the greatest reduction in horsepower, at 840,000 HP. Alternative 12, with 18 ships homeported, would include a total of 1.22 million HP in homeported ship power plants, a reduction of 20 percent from the baseline year of 2006. Based on these reductions, it is reasonable to predict a commensurate decrease in operational air emissions for all alternatives due to proposed reductions in homeported ships in the 2014 end state.

Based on this analysis, it was determined that no further quantitative evaluation of ships emissions was warranted under the detailed analysis of the air quality impacts presented in Sections 4.4.1, 4.4.2, and 4.4.3, and Appendix D.

A similar analytical approach was applied to the analysis of Hazardous Air Pollutant (HAP) emissions. HAPs (also known as toxic air pollutants or air toxics) are those pollutants that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. The USEPA is required to control 188 HAPs. Examples of toxic air pollutants include benzene (which is found in gasoline), asbestos (which is found in some building materials, paper products, plastics, and other products), and methylene chloride (which is used as a solvent and paint stripper by a number of industries). With regard to the alternatives evaluated in this EIS, potential HAPs emissions would primarily be associated with the use of paints, solvents, and fuels associated with ships

Table 4.4-1 Ship and Power Plant Reductions As A Result of the Proposed Action: Comparison of 2006 Baseline to No Action Alternative, Alternative 3, and Alternative 12 End State Homeported Ships and Total Propulsion Horsepower (HP) at NAVSTA Mayport

Ship Type	**Baseline 2006**		**2014 End State**					
			No Action Alternative		**Group 2 Alternative 3**		**Group 3 Alternative 12**	
	Ships	**Power Plant HP**	**Ships**	**Power Plant HP**	**Ships**	**Power Plant HP**	**Ships**	**Power Plant HP**
CV	1	280,000[a]	0	0	0	0	0	0
CG	4	320,0000	4	320,000	4	320,000	4	320,000
DDG	4	400,000	4	400,000	4	400,000	8	800,000
FFG	13	520,000	3	120,000	3	120,000	3	120,000
LHD	0	0	0	0	0	0	2	85,840
CVN	0	0	0	0	v[1]	0[2]	1	0[2]
Totals	22	1,520,000	11	840,000	11	840,000	18	1,217,840

Notes:[1]v a CVN may visit NAVSTA Mayport for up to 63 days per year, with no single visit lasting greater than 21 days (approximately 3 visits per year).

[2]0 is identified for the power plant HP because the CVN is nuclear-powered instead of conventionally powered with internal combustion engines and, therefore, does not have a propulsion system that generates air emissions.

Sources: Dobrzynski 2008 except for a. Military Analysis Network 2000 maintenance activities. Because it is reasonable to assume that HAPs emissions would likely decrease commensurate with the reduction in ships to be homeported at NAVSTA Mayport in the 2014 end state under all alternatives as compared to the 2006 baseline of 22 ships, no further evaluation of HAPs was deemed necessary.

The emission factors for construction include contributions from engine exhaust emissions (i.e., construction equipment, marine engines, material handling, and workers' travel) and fugitive dust emissions (e.g., from grading activities). Dredging emissions evaluated include two different dredging methods and different scenarios for transport and disposal of dredged materials. Grading emissions include fugitive dust from ground disturbance, plus combustive emissions from heavy equipment during the entire construction period. Paving emissions include combustion emissions from bulldozers, rollers, and paving equipment, in addition to emissions from dump trucks hauling pavement materials to the sites. Emissions would occur for the duration of the construction period, from 2011 through 2014 and are provided in Appendix D.

4.4.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

Air emissions for Group 1 alternatives would result from the construction of a DESRON headquarters building under Alternatives 1 and 6 and construction of a PHIBRON headquarters building under Alternative 5. The largest emissions increase would occur with implementation of Alternative 5, as the PHIBRON headquarters building would be slightly larger than the DESRON headquarters. The estimated construction duration is 18 months. Under all Group 1 alternatives, a net loss in personnel from baseline conditions would result in a reduction in commuter emissions. The buildings to be constructed would utilize small boilers exempt from regulation. Table 4.4-2 presents the emissions that were calculated to occur for the 2011-2012 duration of construction. In terms of existing NAVSTA Mayport emissions, the greatest increase would be in PM_{10} emissions that would occur during the construction of the DESRON/PHIBRON headquarters facilities.

Table 4.4-2 Emissions Associated with Alternative 5 Compared to NAVSTA Mayport and Duval County Emission Inventories (in Tons per Year)

	VOCs	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Alternative 5 Year 2011 Emissions	0.01	0.08	0.08	0.01	0.27	0.03
Alternative 5 Year 2012 Emissions	0.02	0.10	0.10	0.01	0.01	0.01
NAVSTA Mayport Emissions (2006)[1]	64.93	2.81	5.85	0.76	0.63	0.63
Duval County Emission Inventory (2001)[2]	45,026	305,875	75,601	64,754	16,868	9,460

Sources: [1] NAVSTA Mayport 2006c
[2] USEPA 2007

4.4.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

Air emissions that would result from implementation of all Group 2 alternatives would include the dredging of 5.2 million cy of material from the NAVSTA Mayport turning basin and entrance channel and federal navigation channel. For Alternatives 7 and 11, emissions also would result from construction of the DESRON headquarters building. As noted in Section 4.1.2, although it is anticipated that dredge material would be disposed of in an USEPA-managed ODMDS, upland disposal would be required for any portion of the material not meeting USEPA requirements for ocean disposal.

Emissions from dredging and disposal were estimated using the following assumptions:

- Mixed use of clamshell dredge (40 percent) and hopper dredge (60 percent)
- Disposal of all material in approved ODMDS (2 million cy to Jacksonville ODMDS and remaining 3.2 million cy to Fernandina ODMDS)

ODMDS placement represents a conservative estimate of the dredge disposal emissions. Emissions would be reduced if dredged materials were to be placed in existing upland disposal sites (see Appendix D). Emissions for Alternatives 7 and 11 would be slightly higher than those for Alternatives 3 and 9 due to the construction of the DESRON headquarters building. As with Group 1 alternatives, a net loss in personnel from baseline conditions would result in a reduction in commuter emissions under all Group 2 alternatives. Table 4.4-3 presents the results of the construction air emissions calculations for Alternatives 7 and 11 (the alternatives with the highest emissions in Group 2) assuming disposal of all dredged material at Jacksonville ODMDS or Fernandina ODMDS. Under these alternatives, and therefore under all Group 2 alternatives, there would be short-term increases in air emissions, primarily due to the dredging equipment and the tug engines used in transport of dredged materials to the ODMDSs. The greatest contribution would be in NO_x emissions, with a maximum of approximately 194 tons estimated to occur in 2011.

The estimated emissions would be a one-time occurrence and are not considered significant given the emissions represent only 0.31 percent of the total 2001 NO_x emissions in Duval County (Table 4.4-4). None of the emissions would represent a substantive attainment risk for the Duval County area.

Table 4.4-3 Estimated Construction Emissions Associated with Group 2 Alternatives 7 or 11 and Disposal of Dredged Material at an ODMDS Compared to NAVSTA Mayport and Duval County Emission Inventories (in Tons per Year)

	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Alternative 7 or 11 Year 2011 Emissions	4.31	37.38	194.19	0.01	5.00	4.81
Alternative 7 or 11 Year 2012 Emissions	2.86	25.39	131.43	0.01	3.08	3.08
NAVSTA Mayport Emissions (2006)[1]	64.93	2.81	5.85	0.76	0.63	0.63
Duval County Emission Inventory (2001)[2]	45,026	305,875	75,601	64,754	16,868	9,460

Sources: [1] NAVSTA Mayport 2006c
[2] USEPA 2007

Table 4.4-4 Comparison of Group 2 Alternatives Maximum Construction Emissions with Duval County Emissions, 2001 (in Tons per Year)

	VOCs	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Group 2 Year 2011 Emissions	4.31	37.38	194.19	0.01	5.00	4.81
Duval County Emissions Inventory (2001)	45,026	305,875	75,601	64,754	16,868	9,460
Percent of 2001 Emissions Inventory	0.01	0.01	0.31	0.00	0.03	0.5

In addition, there would be operational emissions related to visiting CVN crew renting vehicles while in port. Table 4.4-5 presents the calculated emissions for such use based on an estimate of half of the 3,140-person crew renting vehicles for up to 63 days per year and driving, on average, 5 miles a day in the vicinity.

Table 4.4-5 Estimated Operational Emissions (in Tons per Year) from Group 2 Alternatives

	VOC	CO	NO_x	SO_2	PM
Alternatives 3, 7, 9 and 11 (use of rental vehicles while in port)	0.37	3.44	0.37	0.00	0.02

4.4.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Air emissions for Group 3 alternatives would result from the same dredging project that would occur under Group 2 alternatives. In addition to dredging, all Group 3 alternatives would include construction of CVN nuclear propulsion plant maintenance facilities, including a CIF, SMF, and MSF. Alternatives 8 and 12 also would include construction of DESRON headquarters facilities.

As with Group 2 alternatives, the largest emissions increase results from dredging and dredged material disposal activities occurring as part of the ocean disposal scenario, with disposal of all material at Jacksonville ODMDS or Fernandina ODMDS generating the highest emissions overall. Emissions for Alternatives 8 and 12 would be slightly higher than those for Alternatives 4 and 10 due to the construction of the DESRON headquarters building. A net increase in personnel from baseline conditions would result in a proportional increase in commuter emissions for Alternatives 10 and 12, once construction is complete, ships are homeported, and facilities are staffed. The emissions increase for Group 3 alternatives would be slightly larger than Group 2 alternatives due to the construction of the CVN nuclear propulsion plant maintenance facilities. Table 4.4-6 presents the results of the air emissions calculations for Alternatives 8 and 12 assuming disposal of all dredged material in the ODMDSs.

Table 4.4-6 Maximum Estimated Construction Emissions Associated with Group 3 Alternatives 8 and 12 and Disposal of Dredged Material at an ODMDS Compared to NAVSTA Mayport and Duval County Emission Inventories (in Tons per Year)

	VOCs	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Alternative 8 or 12 Year 2011 Emissions	5.07	40.12	199.04	0.55	5.29	6.32
Alternative 8 or 12 Year 2012 Emissions	3.94	29.29	137.86	0.76	9.98	4.10
Alternative 8 or 12 Year 2013 Emissions	0.65	2.55	3.84	0.46	0.23	0.42
Alternative 8 or 12 Year 2014 Emissions	0.06	0.37	0.43	0.05	0.03	0.03
NAVSTA Mayport Emissions (2006)[1]	64.93	2.81	5.85	0.76	0.63	0.63
Duval County Emission Inventory (2001)[2]	45,026	305,875	75,601	64,754	16,868	9,460

Sources: [1] NAVSTA Mayport 2006c
[2] USEPA 2007

The maximum construction emissions under Group 3 alternatives, presented in Table 4.4-7, would represent only a small fraction of the Duval County emissions, with NO_x providing the largest contribution at approximately 0.26 percent.

Table 4.4-7 Comparison of Group 3 Alternatives Maximum Emissions with Duval County Emissions, 1990 and 2001 (in Tons per Year)

Group 3 Alternatives 8 and 12	**VOCs**	**CO**	**NO_x**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Group 3 Year 2011 Emissions	5.07	40.12	199.04	0.55	5.29	6.32
Duval County Emission Inventory (2001)	45,026	305,875	75,601	64,754	16,868	9,460
Percent of 2001 Emissions Inventory	0.01	0.01	0.26	0.00	0.03	0.07

Operationally, all new point sources of emissions would be subject to existing permitting requirements and the base air emissions inventories would require updates to reflect new point sources of criteria and HAP emissions. Modifications to the current base-wide Title V Permit would be required if equipment other than mobile sources (e.g., a spray paint booth) were added or replaced. No modification to the Title V Permit would be required for changes or additions to mobile equipment. Currently, the primary stationary sources that are expected to be added are boilers to the new buildings to be constructed. In addition, for two of the alternatives under Group 3 (Alternatives 10 and 12), a net increase in NAVSTA Mayport personnel would likely result in an increase in commuter mobile source emissions. The greatest increase would be the gain of approximately 1,200 in net daily population under Alternative 12. As shown in Table 4.4-8, combined with the annual emissions from operating up to 12 boilers (a conservative estimate based on the fact that some buildings would have more than one boiler, with all boilers using natural gas with no controls), the maximum emissions of CO could increase by approximately 41 tons per year. Emission estimates for boilers and commuter emissions can be found in Appendix D.

Table 4.4-8 Estimated Maximum Operational Emissions (Tons per Year) from Group 3 Alternatives, 2014 Forward

Group 3 Alternative	VOC	CO	NO_x	SO_2	PM_{10}	$PM_{2.5}$
Alternatives 4 and 8 (12 boilers)	0.58	8.83	10.51	0.06	0.80	0.80
Alternative 10 (12 Boilers and 5 Commuters)	0.59	8.97	10.53	0.06	0.80	0.80
Alternative 12 (12 Boilers and 1,169 Commuters)	4.08	41.39	14.00	0.08	0.99	0.99

4.4.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, none of the construction activities, personnel relocations, or operations proposed would occur at NAVSTA Mayport. Air pollutant emissions would be expected to reduce due to the decrease in the net daily population and commensurate decreases in mobile sources.

4.4.5 Mitigation Measures

During dredging activities, the use of modern dredging equipment with USEPA rated tier 1, tier 2 or tier 3 diesel engines to the greatest extent practicable would help minimize NO_x emissions. Newer engines built after 2000 usually conform to a minimum of tier 1, which are specifically designed to reduce NO_x emissions. Tier 2 and 3 rated engines meet progressively more stringent NO_x emissions standards. FDEP does not regulate mobile sources and, as such, the emissions from the additional commuters would not be regulated by the state. However, if the Navy proceeds with Alternative 12, then proactive practices to minimize the impact of increased mobile source emissions will be considered. In addition to encouraging car pooling, the use of hybrid vehicles, use of mass transit by employees, and other alternative forms of transportation already in place (e.g., use of golf carts by ship repair contractors and several larger commands for routine transportation around the Station), NAVSTA Mayport will consider the conversion of the current base shuttle service to Low Emission Vehicles during re-competition of that contract scheduled for 2009/2010. With institution of the February 2007 USEPA rule that limits the benzene content of gasoline and sets new standards for exhaust and evaporative emissions from passenger vehicles, the gasoline-powered segment of NAVSTA Mayport's vehicle fleet would be replaced over time with vehicles producing significantly fewer emissions than the current models, at a minimum, and hybrid replacement will be considered and implemented wherever practicable. (Currently, approximately 50 percent of the NAVSTA Mayport vehicle fleet is powered by natural gas.)

4.5 NOISE

Generally, noise impacts are considered adverse if they expose sensitive noise receptors to noise levels in excess of applicable standards established in the noise ordinance. For this EIS, factors considered in the analysis of noise impacts were: 1) operation of land-based construction equipment, particularly during nighttime hours (10:00 p.m. to 7:00 a.m.), and 2) noise levels exceeding 65 dBA for sensitive noise receptors during daytime hours or 60 dBA during nighttime hours. As noted in Section 3.5, aircraft noise is not evaluated because aircraft operations at NAVSTA Mayport would not change as a result of implementation of any of the 12 action alternatives or the No Action Alternative.

4.5.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

Under Group 1 alternatives, minor construction activities would occur well within NAVSTA Mayport boundaries (DESRON headquarters associated with Alternatives 1 and 6 and PHIBRON headquarters associated with Alternative 5.) The NAVSTA Mayport Medical and Dental Clinic would typically be considered a sensitive noise receptor, but does not provide overnight care like other medical facilities included in this classification. The clinic is located approximately 175 ft to the west of this site and would be impacted for a short term by the construction noise, even though it is on the fringes of the 177-ft radius of construction noise impacts (see Section 3.5.2). Impacts would not be considered significant because noise levels would not exceed 65 dBA, construction typically would not start before 7:00 AM and would finish by dark, well before 10:00 p.m., and the clinic does not provide in-patient (i.e., overnight) care. The next closest sensitive noise receptor is the Child Development Center, which is located approximately 1,800 ft south of the site for the DESRON or PHIBRON headquarters. Construction noise off-Station would be minimal or non-existent.

4.5.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

Under Group 2 alternatives, construction noise impacts from the construction of the DESRON headquarters for Alternatives 7 and 11 would be similar to those discussed for Alternatives 1 and 6 in Section 4.5.1. In addition, noise would result from dredging of the NAVSTA Mayport turning basin and entrance channel and federal navigation channel. Noise resulting from dredging activities would include watercraft (tugboats and barges), dredging equipment, and human activity. Dredging activities would not include blasting. Noise levels would be comparable to those that currently occur during periodic maintenance dredging of the NAVSTA Mayport turning basin and entrance channel (performed for the Navy, on average, every two years) and the Harbor Bar Cut 3 federal navigation channel (dredged on an as needed basis by USACE approximately every 3 years). However, in order to reach the additional depth required for CVN capability, dredging would occur for a comparatively longer period of time. Whereas existing maintenance dredging of the NAVSTA Mayport turning basin and entrance channel and federal navigation channel is conducted during a three- to six-month time period, the proposed dredging project would require 12 to 18 months to complete. Operations for the proposed action would be up to 24 hours a day, 7 days a week, which is a condition that often occurs with periodic dredging activities.

For the purposes of this analysis, it was conservatively estimated that average noise levels from dredging would be loud enough to be annoying to on-land sensitive noise receptors as far as 2,000 ft from where dredging would occur. Based on this assumption, the only off-Station sensitive noise receptor potentially affected by the dredging activities is the City of Jacksonville Huguenot Park (undeveloped land defined as a sensitive receptor in the city's noise ordinance), which is located approximately 1,500 ft north of the NAVSTA Mayport entrance channel dredge area. Although construction dredging would occur over a multiple-year time frame and during both day and night conditions, impacts would be minor, short-term and below significance thresholds because noise levels at sensitive receptors would not be expected to exceed 65 dBA during daylight hours or 60 dBA during nighttime hours.

4.5.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Under Group 3 alternatives, noise impacts of dredging would be as described for Group 2 alternatives (Section 4.5.2). The impacts from noise generated from on-land construction would be greater because a larger area would be affected by construction activities over multiple years. No off-Station sensitive noise receptors are within 177 ft of proposed on-Station construction activities.

Within NAVSTA Mayport, the Mayport Chapel is located approximately 100 ft north of the Massey Road widening area of potential development proposed under Group 3 alternatives, and the Medical and Dental Clinic, is approximately 150 ft north of the Massey Road widening area (all Group 3 alternatives) and approximately 175 ft west of the DESRON headquarters building proposed under Group 3 Alternatives 8 and 12.

In addition, vibration effects could occur as a result of the estimated one hour of pile driving associated with the installation of Type III hurricane moorings at Wharf F under Group 3 improvements; however, no sensitive noise receptor would be located within the 525-ft radius (worst case, impact pile driving, see Table 3.5-3) of where vibration producing activity would occur. Therefore, as with Group 1 and Group 2 alternatives, noise impacts to the human environment would not be significant because noise levels at sensitive receptors would not be expected to exceed threshold levels and land-based construction typically would not occur during nighttime hours.

4.5.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, there would be no impacts or changes to the existing noise environment at NAVSTA Mayport because no construction or dredging activities would take place as proposed under the 12 action alternatives.

4.5.5 Mitigation Measures

No mitigation measures are required because there are no significant or adverse impacts due to noise.

4.6 BIOLOGICAL RESOURCES

This section analyzes the potential for impacts to biological resources from implementation of the action alternatives and the No Action Alternative. Factors considered in the analysis of potential impacts to biological resources include: 1) importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resources; 2) proportion of the resource that would be affected relative to its occurrence in the region; 3) sensitivity of the resource to proposed activities; and 4) duration of ecological ramifications. Impacts to biological resources are significant if species or habitats of concern are adversely affected over relatively large areas or disturbances cause reductions in population size or distribution of a species of concern.

4.6.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

4.6.1.1 Marine Communities

The following section discusses the potential impacts to marine flora and invertebrates with implementation of Group 1 alternatives. The discussion of impacts to other marine resources such as fish and EFH, federally listed species (e.g., sea turtles), and marine mammals are included under Sections 4.6.1.2, 4.6.1.4, and 4.6.1.5, respectively.

Implementation of any Group 1 alternative would involve minor terrestrial construction activities with Alternatives 1 and 6 (DESRON headquarters) and Alternative 5 (PHIBRON headquarters) and there would be no new in-water construction or dredging activities with any of the alternatives. Alternative 2 requires no new construction. Therefore, there would be no impacts to marine flora, invertebrates, and marine fish with implementation of any Group 1 alternative.

4.6.1.2 Marine Fish and EFH

For the same reasons noted above for marine flora and invertebrates, there would be no impacts to marine fish and no adverse impacts to EFH with implementation of any Group 1 alternative.

4.6.1.3 Terrestrial Communities

Proposed construction activities associated with Alternatives 1, 5, and 6 would require vegetation removal in landscaped and previously disturbed areas at the approximately 0.5-acre site for the DESRON or PHIBRON headquarters, and would temporarily displace wildlife from suitable habitat in the immediate vicinity of the project area. However, due to the lack of sensitive vegetation and wildlife species at the site, proposed construction would not have significant impacts on vegetation or wildlife. Therefore, there would be no significant impacts to terrestrial vegetation and wildlife with implementation of any Group 1 alternative.

4.6.1.4 Federally Threatened and Endangered Species

Proposed construction activities associated with Group 1 alternatives would require vegetation removal in landscaped and previously disturbed areas. No threatened or endangered species are known to occur within the vicinity of the proposed construction activities. The approximately 660 annual baseline Navy vessel transit activities between the Sea Buoy and the NAVSTA Mayport pier (see Table 3.8-6) would be expected to decrease commensurate with the decrease in homeported ships under any Group 1 alternative, thereby reducing the long-term potential for NAVSTA Mayport homeported vessels to strike threatened and endangered species during these transits (primarily a concern with whales). A 9 percent decrease in Navy vessel transit activities from homeported ships at NAVSTA Mayport was calculated for Group 3 Alternative 12, which involves the homeporting of the greatest number of ships (18 ships in the 2014 end state, see Section 4.8.3.2). By comparison, in the 2014 end state, 15 ships would be homeported under Group 1 Alternative 1, 13 ships would be homeported under Group 1 Alternative 2, 14 ships would be homeported under Group 1 Alternative 5, and 17 ships would be homeported under Group 1 Alternative 6.

Navy vessel transit activities are addressed in the Navy's 1997 Regional BO with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast (NMFS 1997b). In 1997, there were 25 ships homeported at NAVSTA Mayport. The Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport, under the East Coast Range Complex consultation, which is part of the Navy's Tactical Training Theater Assessment Planning Program (TAP). The Navy will continue to implement NRW protective measures already in effect in accordance with the NMFS Regional BO issued in 1997 (NMFS 1997b) during calving season and within the consultation area. These include increased vigilance with respect to avoidance of vessel-whale interactions, ensuring at least two lookouts who have completed NMFS approved marine mammal awareness training are posted, and not knowingly approaching any whale head on/maneuvering to keep at least 500 yards away from any observed whale, consistent with vessel safety. The NMFS BO for the East Coast Range Complex is expected in April 2009. Homeporting of ships under any of the Group 1 alternatives would not be expected to occur until late FY 2009 or early FY 2010 (i.e., after the release of the BO for the East Coast Range Complex).

In addition, the Navy will continue to participate in the NRW Early Warning System that is currently in place for the sole purpose of providing mariners with NRW sighting locations as quickly as within 30 minutes of a potential encounter. Four aerial survey teams fly over Florida and Georgia waters during the calving season (December through March), working in conjunction with the Coast Guard and Navy to broadcast sighting locations through the marine communication network (FWRI 2007c).

Therefore, implementation of any Group 1 alternative would not affect federally threatened and endangered species.

4.6.1.5 Marine Mammals

Implementation of any Group 1 alternative would involve minor terrestrial construction activities and there would be no new in-water construction or dredging activities. In addition, as noted in Section 4.6.1.4, there would be a decrease in Navy vessel transit activities associated with NAVSTA Mayport homeported ships with implementation of any Group 1 alternative. No serious injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed are expected with implementation of any Group 1 alternative.

4.6.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

If upland dredged material disposal is required for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal, material would be placed at existing permitted sites near NAVSTA Mayport. Use of these sites are subject to ongoing operational permit conditions that address potential impacts to biological resources, including threatened and endangered species. The Navy would comply with all applicable requirements; therefore, associated biological resource impacts would not be significant.

4.6.2.1 Marine Communities

The following section discusses the potential impacts to marine flora and marine invertebrates with implementation of any Group 2 alternative. The discussion of impacts to other marine resources such as fish and EFH, federally listed species (e.g., sea turtles), and marine mammals are included under Sections 4.6.2.2, 4.6.2.4 and 4.6.2.5, respectively.

Implementation of any Group 2 alternative would involve additional dredging to deepen areas that are currently dredged (i.e., NAVSTA Mayport turning basin and entrance channel, and federal navigation channel) and the disposal of dredged material in an USEPA-managed ODMDS (2 million cy to Jacksonville ODMDS and 3.2 million cy to Fernandina ODMDS). All proposed dredging activities would be conducted in accordance with permit specifications provided by the USEPA, USACE, FDEP, and other appropriate agencies. Proposed dredging activities would result in short-term impacts to marine flora and invertebrates from temporary suspension of sediments and increased turbidity in the vicinity of the dredging areas and within the ODMDS as a result of the removal and disposal of dredged material (see Section 4.3.2.2 for more details). Therefore, there would be no significant impacts to marine flora and invertebrates with implementation of any Group 2 alternative.

4.6.2.2 Marine Fish and EFH

For the same reasons noted above for marine flora and invertebrates, there would be no impacts to marine fish with implementation of any Group 2 alternative.

The proposed dredge project is located within the vicinity of designated EFH for two MAFMC-managed, four SAFMC-managed, and 15 NMFS-managed FMUs. HAPCs are designated for the SAFMC FMUs and occur within the vicinity of the proposed dredging activities. EFH or HAPCs do not occur within the ODMDS sites.

MAFMC EFH

The two FMUs managed under MAFMC have EFH designated for juveniles and adults within the St. Johns River Estuary. Bluefish and summer flounder are not estuarine resident species and would only utilize the area on a seasonal basis, primarily in the warmer summer months. Potential direct impacts to these species and EFH would be short-term from turbidity during proposed adjacent dredging activities in the ROI. These short-term impacts may cause fish to temporarily avoid the area. However, fish would be expected to return to the area upon conclusion of the proposed project.

Potential indirect impacts to EFH for these FMUs would include potential changes in estuarine habitat within the St. Johns River from proposed channel deepening. As discussed in Section 4.3.2.2, results of hydrodynamic modeling show that currents and salinity levels in the NAVSTA Mayport turning basin and entrance channel and federal navigation channel would not change significantly from existing conditions following the proposed dredging project. Therefore, there would be no adverse impacts to MAFMC FMU EFH with implementation of the Group 2 alternatives.

SAFMC EFH

The four FMUs managed under SAFMC have EFH designated in the coastal inlet associated with the NAVSTA Mayport entrance channel and federal navigation channel. The coastal inlet is also designated as HAPCs for red drum and Panaeid shrimp. Coastal inlets are typically areas where a large diversity of fish and invertebrates are found during key elements of their life history, including spawning, larval settlement, and the transition from juvenile to adult life stages. Activities associated with fish and invertebrate larval phases are linked to the extreme tidal flow of water, which often carries large numbers of larvae into and out of an inlet area. Potential direct impacts to larval stages of these four FMUs would be from entrainment during hydraulic dredging operations. It is important to note that tidal conditions as well as vertical migration are instrumental in larval distribution within an inlet and, therefore, not all larvae are vulnerable to entrainment. Data for concentrations of larval species in the tidal prism within the ROI are not available. However, a study done for an inlet in North Carolina determined that, even under the worst-case scenario (i.e., dredge operates 24 hours a day, all larvae are in the dredging area, on the bottom, and with poor retention in the estuary following flood stage), entrainment mortality was determined minimal and impacts to population levels as a result of entrainment would be insignificant (Settle 2005; USACE 2008). From this information, it is expected that proposed dredging activities and potential entrainment of larval stages of fish species would not adversely impact SAFMC FMU larval populations occurring within coastal inlet EFH.

As discussed for the MAFMC FMUs, juvenile and adult SAFMC managed FMUs may be temporarily disturbed from actions associated with the proposed dredging operations and may avoid the area during dredging operations. There are no hard-bottom habitats located within the dredging prism that would be excavated during dredging operations. As discussed in Section 4.3.2.2, potential indirect impacts from turbidity or sediment transport on nearby hard bottom habitat would be minimal and short-term. There would be no adverse impacts to MAFMC FMU EFH with implementation of any Group 2 alternative.

The 15 HMS FMUs have EFH designated within marine and estuarine water column habitats. Sailfish (billfish) have EFH primarily occurring in the pelagic coastal waters that would include the areas of the federal navigation channel and the vicinity of the ODMDs. EFH for shark species listed in Table 3.6-1 generally occurs within the inlets and estuaries. Potential impacts to EFH for these FMUs are primarily the avoidance of EFH due to increases in turbidity during dredging activities. As discussed above for MAFMC- and SAFMC-managed FMUs, avoidance of the area by fish species due to proposed dredging activities is expected to be temporary and no adverse impacts to HMS EFH with implementation of the Group 2 alternatives are expected.

4.6.2.3 Terrestrial Communities

Proposed construction activities associated with Group 2 alternatives (DESRON headquarters under Alternatives 7 and 11) would require vegetation removal in landscaped and previously disturbed areas, and would temporarily displace wildlife from suitable habitat in the immediate vicinity of the project area. However, due to the lack of sensitive vegetation and wildlife species at the proposed sites, proposed construction would not have significant impacts on vegetation or wildlife. Wetland habitats on the southern shore of the NAVSTA Mayport entrance channel would not be affected by proposed dredging activities. Therefore, there would be no significant impacts to terrestrial vegetation and wildlife with implementation of any Group 2 alternative.

4.6.2.4 Federally Threatened and Endangered Species

Proposed terrestrial construction activities associated with Group 2 alternatives (DESRON headquarters under Alternatives 7 and 11) would require vegetation removal in landscaped and previously disturbed areas. No threatened or endangered species are known to occur within the vicinity of the proposed construction activities. Therefore, implementation of any Group 2 alternative would have no effect on federally threatened and endangered terrestrial species.

Implementation of any Group 2 alternative would involve additional dredging in areas that are currently dredged (i.e., turning basin, entrance channel, and federal navigation channel) and the disposal of dredged material in a USEPA-managed ODMDS. Federally listed marine species that may potentially occur within the dredged areas or the ODMDS are the loggerhead, leatherback, Kemp's ridley, and green sea turtles; humpback whale; NRW; sei whale; fin whale; blue whale; sperm whale; and Florida manatee.

Sea Turtles

Proposed construction activities associated with Group 2 alternatives (DESRON headquarters under Alternatives 7 and 11) would have no effect on sea turtles. All facility pre- and post construction activity and facility lighting would occur away from nesting beaches (artificial lighting in beach areas can interfere with turtle nesting and result in disorientation of hatchlings towards the artificial light source and not to the ocean).

As noted in Section 2.3.1.1, the dredging equipment likely to be used by the contractor (USACE) includes a hopper dredge, clamshell dredge, cutterhead dredge, and a bed-leveler. Incidental takes of sea turtles have only been documented from hopper dredge operations that use trailing suction dragheads (NMFS 1991, 1995, 1997a). As of 2004, there has been no recorded incidental takes of sea turtles associated with a clamshell or cutterhead dredge (Dickerson *et al*. 2004). Incidental takes of sea turtles have coincided with the use of bed-leveling devices; however, no conclusive evidence has been found to link this take to the bed-leveling operations (NMFS 2003a, b). Operational differences between dredge types contribute to the differences in potential impacts to sea turtles. Although the relatively slow dredging motion of clamshell and cutterhead dredges present minimal risk for sea turtle takes, they are less likely to provide cost-efficient dredging to the required depths when compared to hopper dredging methods. In addition, the slower dredge types are generally restricted to sea surface conditions with waves of less than 3 ft which is often not practicable; therefore, hopper dredges are more frequently used for coastal channel projects (Dickerson *et al*. 2004).

To minimize sea turtle incidental takes by hopper dredges, hopper dredging would take place during periods when turtles are least abundant or least likely to be affected by dredging (approximately May to October). In addition, mitigation measures for potential impacts to sea turtles from hopper dredges would be implemented as part of the proposed action (see Section 4.6.5).

Proposed dredging operations would be conducted using a variety of dredge types; the use of blasting techniques is not anticipated since limestone or bedrock is not expected in the dredging area. The dredge project would be implemented over the course of 12 to 18 months and occur as early as 2011, with dredging operations occurring up to 24 hours per day, 7 days per week during the project phase. Proposed dredging activities may affect sea turtles in the vicinity of the dredging areas and within the ODMDS during project implementation from the removal, suspension, disposal of dredged material. In accordance with section 7 of the ESA, the Navy and USACE, as a co-consulter, have prepared separate BAs for NMFS and USFWS to address potential impacts to those federally listed species under their respective jurisdiction (Appendix B.3). The Navy and USACE anticipate similar terms and conditions to those identified in existing relevant BOs for similar dredging activities to be identified in the NMFS BO for the proposed action. Navy and USACE dredging activities currently comply with such terms and conditions. The Letter of Concurrence will be obtained from the USFWS and the BO from NMFS prior to issuance of the Record of Decision of this EIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision.

In the event a hopper dredge is utilized, terms and conditions are expected to be similar to those contained in the 1995 NMFS Regional BO (NMFS 1995) for hopper dredging along the Southeast U.S. Atlantic Coast and Interim BO (dated 9 April 1997), as amended in the Regional BO (dated 25 September 1997) (NMFS 1997a). Using the Regional BO as a guide, mitigation measures similar to those presented in Section 4.6.5 likely would be implemented during hopper dredging activities, dependent on the conclusion of the current consultation process and identification of specific terms and conditions of the pending NMFS BO.

The Navy also considered the potential for artificial lighting from dredging operations interfering with turtle nesting. Artificial lighting in beach areas can interfere with turtle nesting and result in disorientation of hatchlings towards the artificial light source and not to the ocean. There are no sea turtle nesting beaches within proximity of the proposed dredging. Sea turtle nesting beaches are present only on the Atlantic side of NAVSTA Mayport and not within proximity to dredging activities within the St. Johns River, NAVSTA Mayport entrance channel, or turning basin. Therefore lighting associated with dredging activities would not result in direct lighting to nesting beaches and would have no effect on sea turtle hatchlings.

With implementation of similar terms and conditions outlined in previous NMFS Regional BOs for similar dredging operations within the Southeast Atlantic, implementation of any Group 2 alternative may affect but is not likely to adversely affect sea turtles should clamshell methods be used, and may adversely affect sea turtles should a hopper dredge be used. Based on previous NMFS consultation determinations, bed-leveling activities in association with dredging operations may affect, but are not likely to adversely affect sea turtles (Ross 2007b). These "may affect" determinations apply when sea turtles are present in the project area (see Section 3.6.3.2 for seasonal occurrence information).

Whales

NRW, humpback, sei, fin, blue, and sperm whales potentially occur within the ODMDSs and during transit of the dredged material from the dredge sites to the ODMDSs. They may very rarely occur within the NAVSTA Mayport turning basin and entrance channel, and federal navigation channel. The primary issue associated with the proposed action concerns the potential for shipstrikes of a marine mammal during transit to and from the ODMDSs. From the NAVSTA Mayport entrance channel, one-way transit distance to the center of the Jacksonville ODMDS is approximately 5.5 nm; the distance to the center of the Fernandina ODMDS is approximately 8.5 nm. As stated in Section 2.3.1.2, the Navy would dispose of 2 million cy of dredged material at the Jacksonville ODMDS and 3.2 million cy at the Fernandina ODMDS.

For the proposed project, trips to the ODMDSs would take place over a 12-18 month time period. The total number of vessel trips to and from the ODMDS would range from approximately 2,000 to 6,000 depending on the capacity of the barge or hopper dredge being used or a combination of vessel sizes.

As with the Group 1 alternatives, the approximately 660 annual baseline Navy vessel transit activities between the Sea Buoy and the NAVSTA Mayport pier (see Table 3.8-6) would be expected to decrease commensurate with the decrease in homeported ships under any Group 2 alternative, thereby reducing the long-term potential for NAVSTA Mayport homeported vessels to strike marine mammals during these transits. A 9 percent decrease in Navy vessel transit activities from homeported ships at NAVSTA Mayport was calculated for Group 3 Alternative 12, which involves the homeporting of the greatest number of ships (18 ships in the 2014 end state, see Section 4.8.3.2). By comparison, in the 2014 end state 11 ships would be homeported under Group 2 Alternative 3, 15 ships would be homeported under Group 2 Alternative 7, 13 ships would be homeported under Group 2 Alternative 9, and 17 ships would be homeported under Group 2 Alternative 11. Also, as with the Group 1 alternatives, the Navy will continue to implement NRW protective measures already in effect in accordance with the Navy's 1997 Regional BO with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast (NMFS 1997b). The Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport, under the East Coast Range Complex consultation and protective measures from these consultations will apply to Navy vessel transit activities. The NMFS BO for the East Coast Range Complex is expected in April 2009. Homeporting of ships under any of the Group 2 alternatives would not be expected to occur until late FY 2009 or early FY 2010 (i.e., after the release of the BO for the East Coast Range Complex).

The potential impacts to these listed whales associated with dredging and disposal activities are addressed in detail in the Navy's BA (Appendix B.3), and include the mitigation measures as presented in Section 4.6.5. These mitigation measures include protection measures the Navy has used since 1996 as standard protocol for their operations (NMFS 1997b). Dependent on the conclusion of the current consultation process and identification of specific terms and conditions of the pending NMFS BO for this project, similar measures presented in Section 4.6.5 likely would be implemented as part of the proposed action to ensure that these listed species are not adversely affected by proposed dredging and disposal activities.

In addition, the Navy and the USACE will continue to participate in the NRW Early Warning System that is currently in place for the sole purpose of providing mariners with NRW sighting locations as quickly as within 30 minutes of a potential encounter. Four aerial survey teams fly over Florida and Georgia waters during the calving season (December through March), working in conjunction with the Coast Guard and Navy to broadcast sighting locations through the marine communication network (FWRI 2007c).

Proposed dredging activities may result in short-term, minor effects to whales in the vicinity of the ODMDS from the disposal of dredged material (e.g., suspension of sediments). Analysis of potential effects of the proposed action on NRW critical habitat was based on an analysis of the impacts on the habitat itself and those elements that make up habitat. The actual physical habitat located outside the St. Johns River channel is part of the designated NRW critical habitat, and no alteration to this portion of critical habitat would occur. The ODMDSs are located in NRW critical habitat, but dredged materials would settle out to the benthos, which is not considered part of critical habitat. Dredged materials would travel through the water column and would result in short-term changes to the water column as sediments settle on the seafloor. These short-term changes in the water column are considered discountable. Based upon the current analysis of potential effects on designated critical habitat, implementation of the Group 2 alternatives within the action area would not compromise the function or relevance of any habitat indicators or critical habitat elements. Proposed activities would not increase fragmentation of the NRW population, nor decrease the function of any calving areas. Therefore, implementation of the proposed action would not destroy or adversely modify NRW critical habitat. Dependent on the conclusion of the current consultation process and identification of specific terms and conditions of the pending NMFS BO, similar measures presented in Section 4.6.5 likely would be implemented such that Group 2 alternatives may affect but are not likely to adversely affect NRWs and humpback whales. Because sei, fin, sperm, and blue whales are seen in the ROI on very rare occurrence, any effects to these species from implementing any Group 2 alternative would be discountable.

Florida Manatee

Manatees have been observed within the entrance channel and federal navigation channel. They may occur rarely but are not expected within the turning basin or at the ODMDSs. As stated in Section 3.6.3, individual manatees have been observed on average six times per year along the south side of the entrance channel. As with other marine mammals, the primary threat to manatees is collision with marine vessels. There are also concerns about direct impacts to manatees from bucket operations during nighttime clamshell dredging activities. During the period when proposed nighttime clamshell dredging would occur in the turning basin (15 October – 15 April), the occurrence of manatees in the vicinity of NAVSTA Mayport is very rare because the Intracoastal Waterway which is used for seasonal manatee migration is more than 5 miles west of NAVSTA Mayport, manatee use of the Intracoastal Waterway peaks during May through July and sometimes September, and the area around NAVSTA Mayport, particularly the entrance channel and turning basin, is not expected to attract manatees due to lack of foraging habitat (Jacksonville City Council 2006).

The Navy prepared a BA for USFWS to address potential impacts to the Florida manatee (see Appendix B.3). The BA outlines measures to be incorporated into the proposed action to minimize threats to manatees and includes NAVSTA Mayport's adoption of the Duval County *Manatee Protection Plan* (Jacksonville City Council 2006) as a guide. The following protective measures, already implemented by NAVSTA Mayport would be carried forward as part of the proposed action: 1) retrofitting station-owned small craft vessels with propeller guards, 2) minimizing basin speed limits in accordance with security posture, 3) reducing or eliminating freshwater sources; 4) establishing a formal manatee notification protocol to report sightings in the basin to Harbor Operations and other ships, and 5) providing manatee awareness training for personnel (DoN 2007b). In addition, during proposed dredging operations, all personnel would adhere to the USACE *Special Manatee Protection Conditions* (USACE 2003). If manatees were observed within 50 ft of proposed dredging operations, dredging activities would be halted until the animal leaves the area. Measures presented above would be implemented such that any Group 2 alternative may affect but is not likely to adversely affect the Florida manatee or adversely modify Florida manatee designated critical habitat. The Letter of Concurrence will be obtained from the USFWS prior to issuance of the Record of Decision of this EIS. The conditions of the USFWS Letter of Concurrence will be identified in the Record of Decision.

4.6.2.5 Marine Mammals

Impacts to marine mammals with implementation of any Group 2 alternative would be the same as those previously discussed above for special status species. The same protective measures (e.g., NRW Early Warning System and 24-hr/day lookout who has completed NMFS approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision.) would minimize impacts on all marine mammals. In general, dredging activities already occur in the project area as part of periodic maintenance; however, the volume of dredge material associated with construction dredging under Group 2 alternatives would result in larger scale and longer duration dredging actions. Sounds from dredges can be quite variable, depending on the phase of operation. Generally, the highest levels occur during loading. Measurements of source noise levels for clamshell dredges centered at 250 Hz varied from 150 to 162 dB re 1 uPa at one meter (the re or reference value follows the dB symbol; in underwater acoustics the standard reference value is one-millionth of a Pascal, or re 1 uPA). The strongest sound is from the winch motor that pulls the loaded clamshell back to the surface producing sound at a broadband source level of 167 dB re 1 uPa at one meter. A short, transient clank is also associated with the closing of the clamshell, but it contains little acoustic energy (Richardson *et al.* 1995). As previously noted, the use of blasting techniques is not anticipated since limestone or bedrock is not expected in the dredging area.

Other than Florida manatee (rare occurrence) and bottlenose dolphins, it is unlikely that any marine mammals would occur in the turning basin. Coastal bottlenose dolphins are common in the federal navigation channel throughout the year and have been spotted frequently in the turning basin (Mitchell 2007). A study conducted on the effects of dredging noise on bottlenose dolphins determined that frequencies generated from dredging activities were not unlike those generated from shipping, tourist, and recreational boat traffic. Bottlenose dolphins are most sensitive to frequencies from 4 to 20 kilohertz and, although source frequencies generated from a dredging vessel can fall in this range, noise effects are unlikely to acoustically mask bottlenose dolphin sound, particularly when generated within 100 meters of a dredging vessel (Applied Ecology Solutions 2006). In addition, dolphins are highly mobile and are likely to only be in the vicinity of dredging operations for a short period of time. Therefore, in-water noise from dredging activities is not likely to adversely affect bottlenose dolphins. No injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed are expected with implementation of any Group 2 alternative.

4.6.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

As with the Group 2 alternatives, if upland dredged material disposal is required for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal, material would be placed at existing permitted sites near NAVSTA Mayport. Use of these sites is subject to ongoing operational permit conditions that address potential impacts to biological resources, including threatened and endangered species. The Navy would comply with all applicable requirements; therefore, associated biological resource impacts would not be significant.

4.6.3.1 Marine Communities

The following section discusses the potential impacts to marine flora and marine invertebrates with implementation of any Group 3 alternative. The discussion of impacts to other marine resources such as fish and EFH, federally listed species (e.g., sea turtles) and marine mammals are included under Sections 4.6.3.2, 4.6.3.4, and 4.6.3.5, respectively.

Like Group 2 alternatives, implementation of any Group 3 alternative would involve additional dredging in areas that are currently dredged. In addition, minor in-water construction of two Type III heavy weather moorings at Wharf F would be included as required in the proposed homeporting of the CVN (Section 2.4.1.5). Impacts to marine flora and invertebrates in the vicinity of the dredging areas and from mooring construction are expected to be similar to those described for implementation of the Group 2 alternatives (see Section 4.6.2). Therefore, there would be no significant impacts to marine flora and invertebrates with implementation of any Group 3 alternative.

4.6.3.2 Marine Fish and EFH

For the same reasons noted for the Group 2 alternatives (see Section 4.6.2), there would be no adverse effects to marine fish and EFH with implementation of any Group 3 alternative.

4.6.3.3 Terrestrial Communities

Proposed construction activities associated with Group 3 alternatives would require vegetation removal in landscaped and previously disturbed areas encompassing between 30 and 32 acres, and would temporarily displace wildlife from suitable habitat in the immediate vicinity of the project area. However, due to the lack of sensitive vegetation and wildlife species at the proposed sites, proposed construction would not have significant impacts on vegetation or wildlife. Wetland habitats located on the southern shore of the entrance channel and southeast of the Massey Avenue/Bon Homme Richard Street intersection would not be affected by the Group 3 alternatives. Therefore, there would be no significant impacts to terrestrial vegetation and wildlife with implementation of any Group 3 alternative.

4.6.3.4 Federally Threatened and Endangered Species

Proposed terrestrial construction activities associated with Group 3 alternatives would require vegetation removal in landscaped and previously disturbed areas. No threatened or endangered species are known to occur within the vicinity of the proposed construction activities. No new stormwater outfalls (to which Florida manatee can be attracted) would be needed to support the proposed construction, including development to support the nuclear propulsion plant maintenance facilities. Therefore, implementation of any Group 3 alternative would have no effect on federally threatened and endangered terrestrial species.

Like Group 2 alternatives, implementation of any of the alternatives in Group 3 would involve additional dredging in areas that are currently dredged and the potential impacts to federally listed sea turtles and marine mammals would be the same as assessed for Group 2 alternatives (see Section 4.6.2.4).

As with the Group 1 and 2 alternatives, the approximately 660 annual baseline Navy vessel transit activities between the Sea Buoy and the NAVSTA Mayport pier (see Table 3.8-6) would be expected to decrease commensurate with the decrease in homeported ships under any Group 3 alternative, thereby reducing the long-term potential for NAVSTA Mayport homeported vessels to strike marine mammals during these transits. A 9 percent decrease in Navy vessel transit activities from homeported ships at NAVSTA Mayport was calculated for Group 3 Alternative 12, which involves the homeporting of the greatest number of ships (18 ships in the 2014 end state, see Section 4.8.3.2). Comparatively, in the end state, 12 ships would be homeported under Group 3 Alternative 4, 16 ships under Group 3 Alternative 8, and 14 ships under Group 3 Alternative 10. Also, as with the Group 1 and 2 alternatives, the Navy will continue to implement NRW protective measures already in effect in accordance with the Navy's 1997 Regional BO with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast (NMFS 1997b). The Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport, under the East Coast Range Complex consultation and protective measures from these consultations will apply to Navy vessel transit activities. The NMFS BO for the East Coast Range Complex is expected in April 2009. Homeporting of non-CVN ships under any of the Group 3 alternatives would not be expected to occur until late FY 2009 or early FY 2010 (i.e., after the release of the BO for the East Coast Range Complex). The CVN could arrive for homeporting as early as 2014.

4.6.3.5 Marine Mammals

As with the Group 2 alternatives, most impacts to marine mammals with implementation of any Group 3 alternative would be the same as those discussed in Section 4.6.2.4. The same protective measures (NRW Early Warning System and 24-hr/day lookout who has completed NMFS approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision) would minimize impacts on all marine mammals. In addition, with implementation of any Group 3 alternative, there would be a need for in-water construction activities associated with the installation of the Type III hurricane moorings at Wharf F. Use of a pile driver would be needed to install the four plate anchors. The leading edge of the plate anchor that would be used for the moorings has an arrowhead-like form that would minimize pile driving. Given the soil types in the substrate, it may be possible to use a vibratory hammer, which is substantially quieter than a standard pile driver. It is estimated that each of the four piles would require about 15 minutes to be installed, for a total of approximately one hour of pile driving (Seelig 2007). Using a vibratory hammer, if practicable, and extending the 50-ft operational buffer protective measure from USACE's *Special Manatee Protection Conditions* (USACE 2003) to all marine mammals would lessen any potential noise impact on marine mammals (see Section 4.6.5 for more details). With these protective measures, implementation of any Group 3 alternative would not result in serious injury or mortality of any marine mammal species and would have no adverse affects on the annual rates of recruitment or survival of any of the species and stocks assessed.

4.6.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, additional surface ships would not be homeported at NAVSTA Mayport and no construction (including construction dredging) would occur. As with action alternatives, the approximately 660 annual baseline Navy vessel transit activities between the Sea Buoy and the NAVSTA Mayport pier (see Table 3.8-6) would be expected to decrease commensurate with the decrease in homeported ships under the No Action Alternative (11 ships homeported in the 2014 end state), thereby reducing the long-term potential for NAVSTA Mayport homeported vessels to strike marine mammals during these transits. Also, as with all action alternatives, the Navy will continue to implement NRW protective measures already in effect in accordance with the Navy's 1997 Regional BO with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast (NMFS 1997b). The Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport, under the East Coast Range Complex consultation and protective measures from these consultations will apply to Navy vessel transit activities. The Navy's consultation with NMFS under the East Coast Range Complex is ongoing; a BO from NMFS is expected in April 2009. Therefore, there would be no adverse impact to biological resources.

4.6.5 Mitigation Measures

The mitigation measures presented herein are also included in the Navy's BAs submitted to USFWS and NMFS (see Appendix B.3) with the exception that mitigation associated with beach nourishment as addressed in the USFWS BA no longer applies, as the Navy and USACE have determined that beach nourishment is not feasible (see Appendix B.2). Results of pending consultations will be incorporated in the Record of Decision. Mitigation measures that are currently part of standard operating procedures for maintenance dredging would be equally applied during the implementation of the construction dredging proposed under Group 2 and Group 3 alternatives. As noted in Section 4.6.2, in the event a hopper dredge is utilized, and dependent on the conclusion of the current consultation process and identification of specific terms and conditions of the pending NMFS BO, protection measures similar to those outlined below would be implemented. With regard to hopper dredging, conditions of the BO for this project are expected to be similar to those of the 1995 NMFS Regional BO for hopper dredging along the Southeast U.S. Atlantic Coast and Interim BO (dated 9 April 1997), as amended in the Regional BO (dated 25 September 1997) and are therefore, noted below. Table 4.6-1 presents a summary of the protective measures to be used by dredge type and location. As shown in the table, dredging can occur continuously over the 12-18 month period, but various types of dredging equipment may be required for certain seasons of the year to do so.

In particular, measures similar to the following likely would be implemented during dredging activities:

- Observance of a seasonal restriction for hopper dredging operations.
- The use of sea turtle deflecting dragheads on hopper dredges.
- The use of inflow screens, and outflow screens during all hopper dredging operations.
- The use of lookouts (must meet specific education, physical/mental condition, and training specifications defined by NMFS) 24 hours a day, year round to monitor for the presence of endangered species from the bridge during daylight hours during transit to and from the disposal area.
- Monitor the inflow and/or overflow screening during dredging operations while dragheads are submerged, monitor the draghead as it is lifted from the sea surface, and inspect dragheads and inflow and overflow screening/boxes and reporting for threatened and endangered species take.

The following measures would be implemented for protection of NRW and sea turtles as part of the proposed action to ensure that these listed species are not adversely affected by proposed dredging and disposal activities:

- Vessels would avoid to the maximum extent practicable north-south transits through NRW critical habitat during the NRW calving season (December-March) and vessel speed will be as slow as practicable.

- To the extent practicable, vessel operations in NRW critical habitat during the calving season would be minimized and transit course will be altered immediately upon notification of a NRW sighting through the NRW Early Warning System.

- During transport of dredged material to the ODMDSs and when returning to the dredge site, vessels would use extreme caution and proceed at a safe speed such that the vessel can take proper and effective action to avoid a collision with a whale, other marine mammals, or other listed species (e.g., sea turtles); and can be stopped within a distance appropriate to the at-sea prevailing circumstances and conditions. This will significantly reduce the potential for a vessel strike with a listed species.

- A lookout who has completed NMFS-approved marine mammal awareness training would be present 24 hours a day, year round to monitor for the presence of sea turtles and whales from the bridge during daylight hours during transit to and from the disposal area, monitor the inflow and/or overflow screening during dredging operations while dragheads are submerged, monitor the draghead as it is lifted from the sea surface, and inspect dragheads and inflow and overflow screening/boxes and reporting of threatened and endangered species take.

- Additional day-to-day protective measures already in use by the Navy during operations will continue to be implemented (NMFS 1997b).

For the in-water work associated with the Group 3 alternatives, the following protective measures would be implemented:

- Use of a vibratory hammer for pile driving if at all practicable.

- Require operations to cease if any marine mammal comes within 50 ft of the operation and not resume until the animal has moved beyond the 50 ft radius of the project operation or until 30 minutes elapses wherein the animal has not reappeared within 50 ft of the operation.

Table 4.6-1 Sea Turtle and Marine Mammal Protective Measures during Proposed Dredging Operations

Dredging Method	*Dredging Location*	*Timing*	*Protective Measures*		
			Sea Turtles	*NRW and other Marine Mammals*	*Manatee*
Hopper	NAVSTA Mayport Entrance Channel/ Federal Navigation Channel	Spread activity over 12 to 18 months in order to allow for possible trawling to remove sea turtles before hopper dredge activity and limit dredging during nesting season (May to October).	Use sea turtle deflecting dragheads, inflow screens, outflow screens; 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training; observance of seasonal restrictions	NRW Early Warning System and a 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision	Implement Duval County *Manatee Protection Plan*, measures already implemented by NAVSTA Mayport (Section 4.6.2), and adhere to USACE *Special Manatee Protection Conditions*.
Cutterhead	NAVSTA Mayport Turning Basin	Spread activity over 12 to 18 months in order to limit vessel trips to ODMDSs through NRW Critical Habitat and during winter calving season (December to March).	24-hr/day lookout who has completed NMFS-approved marine mammal awareness training	NRW Early Warning System and a 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision	Implement Duval County *Manatee Protection Plan*, measures already implemented by NAVSTA Mayport (Section 4.6.2), and adhere to USACE *Special Manatee Protection Conditions*.
Clamshell	NAVSTA Mayport Turning Basin	Spread activity over 12 to 18 months in order to limit vessel trips to ODMDSs through NRW Critical Habitat and during winter calving season (December to March).	24-hr/day lookout who has completed NMFS-approved marine mammal awareness training	NRW Early Warning System and a 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training; use extreme caution and proceed at safe speed to avoid collision	Implement Duval County *Manatee Protection Plan*, measures already implemented by NAVSTA Mayport (Section 4.6.2), and adhere to USACE *Special Manatee Protection Conditions*.

4.7 CULTURAL RESOURCES

Cultural resources are subject to review under a number of federal laws and regulations. Section 106 of the NHPA of 1966 (as amended) requires that a federal agency consider the effect of a proposed undertaking on significant cultural resources – those listed on or eligible for the NRHP. To qualify as significant, cultural resources must meet at least one of the four NRHP significance criteria. Only cultural resources determined to be significant—known as "historic properties"—are protected under the NHPA. An action affects a historic property when it alters that property's characteristics of integrity, including relevant features of the environment (i.e., location, design, setting, materials, workmanship, feeling, association). In addition to affecting NRHP-listed or eligible cultural resources (archaeological and architectural), an action could affect traditional cultural resources that are eligible to the NRHP.

Analysis of potential impacts to historic properties considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual or audible elements that are out of character for the period the resource represents (thereby altering the setting), or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by identifying the type and location of the proposed action and by determining the exact locations of cultural resources that could be affected. Indirect impacts are those that may occur as a result of the completed project, such as increased vehicular or pedestrian traffic in the vicinity of the resource.

In keeping with Section 106 of the NHPA, the Navy contacted Native American tribes with an expressed interest in Mayport and invited them to consult despite the fact that no significant prehistoric archaeological sites or traditional cultural properties are located in the area of potential effects. No tribe responded to the Navy invitation during the preparation or the public comment period for the DEIS.

The Navy consulted with the Florida SHPO to confirm that appropriate actions would be taken under each of the alternatives (described below) to ensure that historic properties would not be adversely affected in the course of this project undertaking (Appendix E.1).

4.7.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

Construction of the DESRON headquarters under Alternatives 1 and 5 or PHIBRON headquarters under Alternative 6 would occur in previously disturbed areas of NAVSTA Mayport. No known historic properties would be affected either directly or indirectly under this group of alternatives. However, as an additional safeguard, the Navy will attach a post-review discovery clause to the contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery.

In accordance with Section 106 of the NHPA, the Navy consulted with the SHPO to ensure that the Group 1 alternatives would not incur adverse effects on cultural resources (Appendix E.1). During the DEIS public comment period, the Navy received a letter of concurrence from the SHPO for those consultation elements that apply to the Group 1 alternatives (Appendix E.1).

4.7.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

Construction of the DESRON headquarters under Alternatives 7 and 12 would occur in previously disturbed areas of NAVSTA Mayport. No known historic properties would be affected either directly or indirectly under this group of alternatives. However, as an additional safeguard, the Navy will attach a post-review discovery clause to the contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery.

Under Group 2 alternatives there would be dredging of the NAVSTA Mayport turning basin, NAVSTA Mayport entrance channel, and Jacksonville Harbor Bar Cut 3 federal navigation channel. No known historic properties would be affected by dredging activities under this group of alternatives.

Dredging in the federal navigation channel between the NRHP-eligible jetties would occur within the existing dredged areas and would have no effect on the jetties. As noted in Section 3.7.6, the Navy completed a remote sensing survey of the portions of the NAVSTA Mayport entrance channel and federal navigation channel that would be dredged under the Group 2 alternatives (Dolan Research Inc. 2008) (Appendix E.2). Based on a follow-on intensive-level survey in October 2008 of two underwater survey targets suggestive of cultural resources identified within 100 feet of the existing federal navigation channel (Southeastern Archeaolgocial Research, Inc. 2008) (Appendix E.3), it was determined that no NRHP-eligible resources would be affected by the dredging project. Dredged material disposal in an USEPA-managed ODMDS would have no adverse effects as no known cultural resources are present at the ODMDS sites.

In accordance with Section 106 of the NHPA, the Navy consulted with the SHPO to ensure that the Group 2 alternatives would not incur adverse effects on cultural resources (Appendix E.1). Based on the October 2008 intensive-level underwater survey results (Appendix E.3), the Navy has concluded that the undertaking would have no adverse effects on cultural resources and expects concurrence from the SHPO on this determination prior to the Navy's issuance of a Record of Decision.

4.7.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Under Group 3 alternatives, there is little potential to impact historic properties as a result of the construction of CVN propulsion plant maintenance facilities, wharf improvements, transportation improvements, and parking structures. All construction would occur in previously disturbed, built areas of the installation. No known historic properties are located within the areas of potential effects. However, as an additional safeguard, the Navy will attach a post-review discovery clause to the construction contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery. In addition, for the Massey Avenue/Maine Street intersection improvement area construction an archaeological monitor will be present to ensure that any newly discovered cultural resources are taken into account and to confirm that NRHP-eligible prehistoric archaeological site (8DU7458) is avoided.

As discussed with the Group 2 alternatives, the Navy has concluded that the dredge project undertaking would have no adverse effects on cultural resources. Dredged material would be disposed of in an USEPA-managed ODMDS and no known cultural resources are present at the ODMDS sites. In accordance with Section 106 of the NHPA, the Navy consulted with the SHPO to ensure that the Group 3 alternatives would not incur adverse effects on cultural resources (Appendix E.1). Based on the October 2008 intensive-level underwater survey results (Appendix E.3), the Navy has concluded that the undertaking would have no adverse effects on cultural resources and expects concurrence from the SHPO on this determination prior to the Navy's issuance of a Record of Decision.

4.7.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, no dredging or construction would occur. Therefore, there would be no effect on historic properties.

4.7.5 Mitigation Measures

For construction proposed under Group 1 Alternatives 1 and 6, Group 2 Alternatives 7 and 11, and Group 3 alternatives in areas previously disturbed, built areas of the installation where no known historic properties are located within the areas of potential effects, the Navy will attach a post-review discovery clause to the contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery. In addition, for the Massey Avenue/Maine Street intersection improvement area construction under the Group 3 alternatives, an archaeological monitor will be present to ensure that any newly discovered cultural resources are taken into account and to confirm that NRHP-eligible prehistoric archaeological site (8DU7458) is avoided. The Navy consulted with the SHPO to ensure that all alternatives would not incur adverse effects on cultural resources (Appendix E.1) and expects full concurrence from the SHPO prior to issuance of the Record of Decision. No additional mitigation measures are proposed.

4.8 TRAFFIC

The consequences of traffic and available parking for each alternative are weighed against the existing conditions to ascertain any increased, adverse effects. The end state year 2014 projected condition is compared to the baseline condition of 2006.

Factors considered in the analysis of impacts to transportation and circulation includes safety and/or capacity of roads within the ROI and the potential for traffic disruption or congestion along regional and local transportation corridors. Because only Alternative 12 would result in an increase in net daily population at NAVSTA Mayport, off-Station traffic impacts are only analyzed in detail for this alternative.

The primary factor considered in evaluating impacts to marine traffic is whether the additional marine traffic increases to a point where vessels have to wait in anchorages offshore.

4.8.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

4.8.1.1 Vehicle Traffic

For each alternative in Group 1, there would be a net decrease in average daily population from baseline conditions. As a result, there would be less traffic off-Station by military or civilian personnel working at NAVSTA Mayport. On-station traffic would be expected to be reduced from the existing condition commensurate with the reduction in average daily population: -21 percent with Alternative 1, -18 percent with Alternative 2, -19 percent with Alternative 5, and -9 percent with Alternative 6 (see Table 2.1-2). Although there would be a slight increase in personnel loading from 2009 to 2012 under Alternative 6 (see Table 2.2-4), traffic conditions along Mayport Road entering the gate would remain similar to baseline conditions, which is acceptable, and traffic volumes would continue to decrease until the end state year of 2014.

Minimal construction activities are proposed with the construction of DESRON headquarters building (Alternatives 1 and 6) or PHIBRON headquarters building (Alternative 5) east of Bon Homme Richard Street between Massey Avenue and Bailey Avenue. During the period of construction, there could be localized impacts to traffic flow along Bon Homme Richard Street. Proposed construction activities would require the delivery of construction equipment and materials to NAVSTA Mayport, constituting a small portion of the total existing traffic volume. The majority of vehicles used for construction activities would be driven to the construction site and kept onsite for the duration of construction, resulting in only a small increase in vehicle trips. In addition, any increases in traffic volumes associated with construction would be temporary. It may be necessary to implement temporary on-Station traffic detours around the construction site for short periods of time. Even during peak construction periods, impacts to off-Station transportation systems would be negligible.

4.8.1.2 Marine Vessel Transit

With regard to marine traffic, there would be a minor decrease in the Navy's contribution to marine traffic under Group 1 alternatives due to the net decrease in number of ships homeported at NAVSTA Mayport. Under Alternatives 1, 2, 5, and 6, the number of homeported ships would be 15, 13, 14, and 17, respectively—all down from the 2006 baseline of 22 ships. The estimated decrease in vessel transit from homeported ships at NAVSTA Mayport was calculated for Group 3 Alternative 12, which involves the homeporting of the greatest number of ships (see Section 4.8.3.2). Under any Group 1 alternative, there would be no appreciable change to offshore anchorage operations. Therefore, Group 1 alternatives would not result in significant impacts to marine vessel transit.

4.8.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

4.8.2.1 Vehicle Traffic

Similar to Group 1 alternatives, Group 2 alternatives would result in a decrease in net daily population at NAVSTA Mayport (-30 percent with Alternative 3, -21 percent with Alternative 7, -18 percent with Alternative 9, and -9 percent with Alternative 11, see Table 2.1-2). As with Alternative 6, although there would be a slight increase in personnel loading from 2009 to 2012 associated with Alternative 11 (see Table 2.3-5), traffic conditions along Mayport Road entering the gate would remain similar to baseline conditions, which are acceptable, and traffic volumes would continue to decrease until the end state year of 2014. Alternatives 7 and 11 include the construction of a DESRON headquarters building. This construction activity would have the same potential temporary minor impacts on on-Station traffic as described for Group 1 Alternatives 1, 5, and 6 under Section 4.8.1.1.

All Group 2 alternatives would accommodate a visiting CVN that would be in port for a maximum of 63 days per year, with a longest visit of 21 days duration (see Section 2.3.1). During times when the visiting CVN is in port, there would be a temporary influx of the approximately 3,140-person crew. It is expected that while in port many CVN crew would rent cars for transportation for up to a three-week period resulting in a shortage of on-Station parking and an increase in traffic both on- and off-Station; however, the increase in traffic volumes and parking shortfalls would be for short durations and temporary. Under Alternatives 3 and 7, the net daily population would be below baseline levels even during times when the CVN is in port. With Alternative 9, the net daily population during times when the CVN is in port would be similar to the baseline. Under Alternative 11, however, the net daily population would be approximately 1,700 over baseline.

Construction dredging would generate daily vehicle trips on local roadways (both on- and off-Station) for workers between their residences and the dredging operation for the duration of the dredging project. This would generate a small portion of vehicle trips in the context of AADT. Dredged material likely would be disposed of in an USEPA-managed ODMDS and would have no impact on traffic. However, the placement of material at an upland disposal site would be necessary for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal. If upland dredged material disposal is required, the Navy anticipates that existing permitted sites near NAVSTA Mayport could be used for dredge disposal, which would not require trucking material to a disposal site or result in impacts to traffic flow on local roads.

4.8.2.2 Marine Vessel Transit

The proposed dredging of the NAVSTA Mayport turning basin, entrance channel, and the Jacksonville Harbor Bar Cut 3 of the federal navigation channel would provide adequate depth to lift current draft restrictions on the movement of CVNs in and out of NAVSTA Mayport, providing greater fleet operational flexibility on the East Coast.

The movement of commercial, sport, and military ships within the Jacksonville Harbor Bar Cut 3 of the federal navigation channel and in the public transit area between the dredge sites and the ODMDS sites could temporarily be adversely affected by dredging and material disposal activities. Barge trips required for the transit of dredged material to the Jacksonville or Fernandina ODMDSs would temporarily increase marine traffic in the transit area during the 12 to 18 month implementation schedule for the dredging project. To move the estimated volume of dredged materials, it is estimated that approximately 2,000 to 6,000 vessel trips to/from the ODMDSs (depending on barge size) would occur within the proposed dredging time period. Dredge equipment could block access or cause delays in the movement of other marine traffic within the construction area; however, construction activities would not prevent the movement of ships in and out of the harbor. In 2005, there were a total 80,961 vessel movements, which include inbound and outbound trips, within the Jacksonville Harbor (including the St. Johns River Ferry) (USACE 2007). Dredge barge trips occurring over the 18-month duration of the dredging project would represent a small portion of total movements within the Jacksonville Harbor. Based on 2005 levels, this would represent 2 to 5 percent of vessel movements in the Jacksonville Harbor, but is expected to be even less based on factors expected to increase vessel movements in the Harbor (see Section 6.8.3). If upland dredged material disposal is required for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal, the Navy anticipates that material would be hydraulically pumped or transported via barge to existing permitted sites near NAVSTA Mayport. Transport of dredged material by barge would result in localized, temporary impacts on marine traffic between the dredge site and the existing permitted upland disposal site. The marine traffic would not be expected to increase to a level where offshore anchorage would be necessary. After the construction dredging project is completed, these impacts would no longer occur. Ongoing maintenance dredging requirements in the federal navigation channel would be similar to current ongoing maintenance dredging that occurs as needed, approximately every two to three years. In the context of the other marine traffic in the area, this would be a discountable impact to the movement of ships.

The movement of NAVSTA Mayport Navy ships within the turning basin and entrance channel would similarly be impacted by the proposed dredging activities. However, NAVSTA Mayport harbor operations during the dredging period would be similar to operations occurring during ongoing maintenance dredging activities that occur approximately every two years within the turning basin and entrance channel. NAVSTA Mayport provides adequate capacity within the basin for maneuvering and berthing ships around such dredging activities.

Transportation of dredged materials to the Jacksonville or Fernandina ODMDSs could present potential conflicts among marine vessels from potential interference of the transport barges and towlines with other vessel traffic. While maintenance dredging is a common occurrence in the vicinity of NAVSTA Mayport, the duration of such maintenance is typically 3 to 6 months compared to a duration of up to 18 months for the dredging project proposed under Group 2 alternatives.

In the long-term, the amount of marine traffic would decrease at NAVSTA Mayport with Group 2 alternatives since fewer ships would be homeported due to planned decommissioning by the end state year of 2014. Under Group 2 Alternatives 3, 7, 9, and 11, the number of ships homeported at NAVSTA Mayport would be 11, 15, 13, and 17, respectively—all down from 2006 baseline of 22 ships. The estimated decrease in vessel transits at NAVSTA Mayport was calculated for Group 3 Alternative 12, which involves the homeporting of the greatest number of ships (see Section 4.8.3.2). There would be no appreciable change to offshore anchorage operations with any of the Group 2 alternatives.

Given the 18-month dredging schedule, proportion of marine vessel movements from dredging activities associated with the proposed project to other vessel movements, and the relatively minor potential for any safety and navigation-related hazards, impacts to commercial, sport, or military ship movements are expected to be minor.

4.8.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

4.8.3.1 Vehicle Traffic

On-Station Traffic Circulation

The construction activities associated with Group 3 alternatives would be greater than Group 1 or Group 2 alternatives, as CVN nuclear propulsion plant maintenance facilities, parking structures, and transportation improvements would be constructed under all of these alternatives. Additionally, Alternatives 8 and 12 include construction of a DESRON headquarters building, resulting in the same potential impact to transportation and parking as described for Group 1 alternatives in Section 4.8.1. Construction of CVN nuclear propulsion plant maintenance facilities would similarly result in additional vehicle trips associated with delivery of construction materials and equipment and construction workers. Even though a greater number of trips would be generated with this amount of construction as compared to construction of the DESRON headquarters building alone, vehicle trips associated with construction would still constitute a minimal contribution to existing daily traffic volumes at NAVSTA Mayport and on local roads.

Under all Group 3 alternatives, construction of traffic improvements and parking structures would have direct impacts to on-Station traffic and parking. During construction, traffic flow would be disrupted as traffic is rerouted around project sites. As Massey Road is widened, it likely would still accommodate some traffic, but traffic may be reduced to one way or one lane in each direction (eastbound/ westbound). Similarly, traffic probably would still be allowed to flow through intersections while they are undergoing improvements, but traffic movements likely would be slowed by alterations allowing for the construction activities. Effects would be minimized by staggering construction schedules for these improvements to allow for adequate traffic flow on alternate routes during the periods of construction.

In terms of personnel changes and long-term impacts, Alternative 4 would result in a 12 percent decline in personnel from the baseline condition and Alternative 8 would result in a 3.2 percent decline in personnel from the baseline. Alternative 10 would result in a statistically unchanged number of personnel and Alternative 12 would result in a net increase of 9 percent, compared to the baseline condition. The gain in vehicle trips under Alternative 12 were estimated in accordance with published trip generation data in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 7th Edition (ITE 2003), which reports the average weekday trip rate per employee on a military base is 1.78 trips. Accordingly, Alternative 12 would contribute an additional 2,081 vehicle trips per day. At the end state, intersection improvements and Massey Road widening project included in Group 3 alternatives would provide improvements expected to accommodate the increase without a significant adverse traffic impact with all Group 3 alternatives.

Off-Station Traffic Circulation

The potential increased traffic volumes were applied to outside roadways and their AADT counts to indicate the influence of Alternative 12 on circulation around the outside of NAVSTA Mayport. Alternative 12 would add 2,081 (approximately 2,100) vehicle trips per day and would increase ridership on the St. Johns River Ferry and the city bus for the majority of vehicle trips originating north of the Station. Based on the gate use statistics in the 2006 Traffic Study (NAVSTA Mayport 2006d), 84 percent of the NAVSTA Mayport population uses the Main Gate to Access NAVSTA Mayport while 16 percent use Gate 5 (NAVSTA Mayport 2006d). Therefore, for the purpose of this analysis, it is conservatively estimated that traffic increases on local roads that provide access to NAVSTA Mayport would be 20 percent from the north (on the St. Johns Ferry and northern extent of State Route A1A to Gate 5), 40 percent from the west (on Wonderwood Drive leading to the Main Gate), and 40 percent from the south (on Mayport Road/State Route 223 leading to the Main Gate). This percentage is applied in estimating traffic increases along the Mayport Road segment north of State Route A1A.

The estimated increase in use of the St. Johns River Ferry under Alternative 12, therefore, is estimated at 416 vehicle trips per day in 2014. This would represent approximately 44 percent of average daily 2005 ridership levels. The increase with Alternative 12 would result in ridership 131 above the recent higher ridership levels experienced as recently as 2003. The ferry service would be expected to adjust to accommodate the level of increase anticipated with Alternative 12. It is important to note that funding for continuation of the St. Johns River Ferry service into the end state year of 2014 is uncertain. This is further addressed in the cumulative effects analysis in Section 6.8.

Existing traffic volumes were identified from traffic count data available in the FDOT 2007 Florida Traffic Information DVD-ROM and *Florida State Highway System Level of Service Report*, published by the FDOT for Duval County. The FDOT's 2007 AADT historical data was used for the roadway link analyses.

The existing daily traffic along the study area roadways was estimated using the FDOT AADT historical data for years 1997 through 2007. The FDOT AADT historical data for count station locations along the roadway segments is summarized in Table 4.8-1, indicating a general decrease in traffic volume surrounding NAVSTA Mayport and an increase in the east-west Wonderwood corridor. Although AADT counts at station 0828, which occurs along the segment of State Route A1A that traverses the southwestern portion of the Station (see Figure 1.1-1) increased approximate 14 percent from 2006 to 2007, 2007 AADT counts were not as high as 2003 counts.

Table 4.8-1 AADT Estimates for Select Roadways near NAVSTA Mayport

Average Annual Daily Traffic (AADT)							
Count Station Number and Location		**0032 Mayport Road/SR A1A**	**0578 Mayport Road**	**0827 SR A1A**	**0828 SR A1A**	**3916 Wonderwood Drive**	**1028 Wonderwood Drive**
Historical Data	1997	42,000	29,000	11,800	4,600	N/A	N/A
	1998	45,000	29,500	9,400	4,400	N/A	N/A
	1999	42,500	26,000	10,200	4,700	N/A	N/A
	2000	46,500	26,500	9,900	4,500	N/A	N/A
	2001	49,000	26,500	11,800	5,200	N/A	N/A
	2002	48,000	26,500	13,500	6,100	N/A	N/A
	2003	48,500	26,500	13,700	6,600	N/A	3,100
	2004	53,000	31,500	13,400	6,500	N/A	3,100
	2005	44,000	29,500	12,800	5,400	19,700	12,100
	2006	39,000	21,000	15,600	5,600	21,000	11,900
	2007	37,000	17,700	14,300	6,500	21,500	13,400
2006 to 2007 Difference		-2,000	-3,300	-1,300	900	500	1,500
		-5.4%	-18.6%	-9.1%	13.8%	2.3%	11.2%

Note: SR = State Route

The 2008 background traffic projections were developed by applying a growth factor to the existing traffic volumes. The annual growth rate for each road was calculated using the trends analysis program (Traffic Trends) developed by the FDOT to provide growth projections based on historical daily traffic counts. The historical AADT volumes were applied to the FDOT Trends Program to forecast the future year volumes through a linear regression analysis. The trends analysis provides AADT estimates for the current year 2008 through 2014, as shown in Table 4.8-2. This represents how AADT would change in the future regardless of implementation of any of the homeporting alternatives.

Table 4.8-2 AADT Estimates for 2008 through 2014 for Select Roadways near NAVSTA Mayport

Average Annual Daily Traffic (AADT)							
Count Station Number and Location		**0032 Mayport Road/SR A1A**	**0578 Mayport Road**	**0827 SR A1A**	**0828 SR A1A**	**3916 Wonderwood Drive**	**1028 Wonderwood Drive**
Historical Data	1997	42,000	29,000	11,800	4,600	N/A	N/A
	1998	45,000	29,500	9,400	4,400	N/A	N/A
	1999	42,500	26,000	10,200	4,700	N/A	N/A
	2000	46,500	26,500	9,900	4,500	N/A	N/A
	2001	49,000	26,500	11,800	5,200	N/A	N/A
	2002	48,000	26,500	13,500	6,100	N/A	N/A
	2003	48,500	26,500	13,700	6,600	N/A	3,100
	2004	53,000	31,500	13,400	6,500	N/A	3,100
	2005	44,000	29,500	12,800	5,400	19,700	12,100
	2006	39,000	21,000	15,600	5,600	21,000	11,900
	2007	37,000	17,700	14,300	6,500	21,500	13,400
Trend	2008	43,200	22,600	15,300	6,500	22,500	16,700
	2010	42,600	21,300	16,300	6,900	24,300	21,800
	2014	41,500	18,700	18,300	7,700	27,900	32,100

Note: SR = State Route

Table 4.8-3 summarizes the LOS analysis of the roadway segments for 2008 and 2014 under the Alternative 12 scenario. All of the segments except the southern area of Mayport Road near Atlantic Boulevard are expected to operate at an acceptable LOS.

Table 4.8-3 LOS of Select Roadway Segments under Alternative 12

Roadway	**Roadway Segment**	**2008 LOS**	**2014 LOS**	**Alt 12 LOS**
Mayport Road	South of 11th Street	E	E	E
Mayport Road	Mayport Road to Wonderwood Dr	C	C	C
State Route A1A	Mayport Road to Wonderwood Dr	B	B	B
State Route A1A	Wonderwood Dr to Mayport Ferry	B	B	B
Wonderwood Drive	Girvin Road to State Route A1A	A	B	B
Wonderwood Drive	State Route A1A to Mayport Road	B	C	C

This historical AADT data and subsequent 2014 projection from the FDOT Trends Program indicate the Alternative 12 scenario would have minimal impact of the LOS for the study area roadway segments. The traffic volume along the Mayport Road segment near Atlantic Boulevard is expected to decrease slightly from 2008 to 2014. However, the LOS would continue to be deficient at LOS "E". The LOS for the expressway segment of Wonderwood Drive (Girvin Road to State Route A1A) would degrade from LOS "A" to "B" from 2008 to 2014. However, the projected traffic from Alternative 12 would have minimal impact on the roadway and would cause no change in LOS. The LOS for the arterial segment of Wonderwood Drive (State Route A1A to Mayport Road) would degrade from LOS "B" to "C" from 2008 to 2014. However, the projected traffic from Alternative 12 would have minimal impact on the roadway and would cause no change in LOS. All other roadway segments in the analysis would experience no changes to LOS.

Parking

The Group 3 alternatives include the construction of parking structures to address parking demand that would be associated with the displacement of approximately 1,653 parking spaces at the site proposed for development of CVN nuclear propulsion plant maintenance facilities, plus the additional demand from the periodic six-month availability maintenance cycles and increases in net daily population under Alternatives 10 and 12. While the parking structures are being constructed, existing surface parking would temporarily be lost. For Alternatives 4, 8, and 10, this would be the approximately 430 surface parking spaces located at the site of the parking structure along New Maine Street proposed under these alternatives. For Alternative 12, this would include those 430 surface spaces, plus approximately 100 surface spaces at the site southeast of the intersection of Bailey Avenue and Massey Avenue. The temporary loss of these parking spaces would increase parking congestion during the period of construction. The impacts would be lessened if the parking structures were constructed prior to the CVN facilities that would displace 1,653 parking spaces. Use of satellite parking and shuttle services and alternate modes of transportation to reduce the number of POVs on-Station during the period of construction also would reduce impacts.

4.8.3.2 Marine Vessel Transit

The impacts to marine vessel transit for Group 3 alternatives would be similar as described for Group 2 alternatives. Under the Group 3 alternatives, the dredging project and associated vessel transit would be the same as under the Group 2 alternatives. Group 3 Alternatives 4, 8, 10, and 12 would result in 12, 16, 14, and 18 ships homeported, respectively—all down from the 2006 baseline of 22 ships. As indicated in

Table 4.8-4, the number of annual ship movements for homeported ships associated with Alternative 12 (under which 18 ships would be homeported in the end state year of 2014, the highest number of any alternative) was estimated to be approximately 600. This represents a 9 percent reduction from the 2006 baseline. A 20 percent increase was estimated for U.S. Navy and other visiting ships. The total projected end state (2014) non-U.S. Coast Guard annual transits would be at very similar levels to the 2006 baseline

Table 4.8-4 Estimated Annual NAVSTA Mayport Vessel Transits 2006 Baseline and Alternative 12 End State Projection Comparison

Generator of Transits	**2006 Baseline**	**2014 End State**	**Percent Change**
Ships homeported at NAVSTA Mayport	661	604	-9
U.S. Navy ships visiting NAVSTA Mayport	83	100	+20
Other visiting ships (e.g., foreign navy, special units, contractors)	260	312	+20
Totals	**1,004**	**1,016**	**+1**

Source. USFF 2008b and Dussia 2008

4.8.4 No Action Alternative (Alternative 13)

4.8.4.1 Vehicle Traffic and Parking

The result of the No Action Alternative as it concerns traffic and parking is a reduction in personnel at NAVSTA Mayport. There would be approximately 3,900 fewer net daily on-Station personnel at the end state year 2014 compared to the baseline year 2006. There is no adverse impact on traffic or parking for the No Action Alternative.

4.8.4.2 Marine Vessel Transit

The No Action Alternative would result in a decrease in the number of ships homeported at NAVSTA Mayport from 22 to 11 due to various ship decommissioning scheduled to occur by 2014. In addition, the No Action Alternative does not require additional dredging to accommodate CVN unrestricted draft requirements. CVNs would continue to visit NAVSTA Mayport but access would be restricted by tidal and weather conditions an estimated one to two times per year for one to two days at a time. There would be no appreciable change to offshore anchorage operations. Ongoing maintenance dredging would continue, requiring dredge and barge transit between the turning basin and entrance channel dredge sites and the Jacksonville ODMDS or other dredge material disposal sites.

4.8.5 Mitigation Measures

4.8.5.1 Traffic and Parking

NAVSTA Mayport would continue to encourage and support alternative transportation options for personnel living off-Station such as the transportation incentive program, vanpool service, and using Park-N-Ride lots serviced by Jacksonville Transportation Authority. The current Jacksonville Transportation Authority bus service for NAVSTA Mayport has adequate capacity to support additional ridership (approximately 22 available seats per ride during peak hours), and Jacksonville Transportation Authority would consider increasing service to the base if there was a significant increase in demand beyond current capacity (Haley 2008).

4.8.5.2 Marine Vessel Transit

No mitigation would be required for marine vessel transit under any of the alternatives.

4.9 SOCIOECONOMICS

Factors considered in the analysis of socioeconomic impacts include demographics, housing, NAVSTA Mayport economic impact, and taxes and revenues. This analysis of potential impacts of the alternatives fully considers the context of other independent actions affecting NAVSTA Mayport/Duval County socioeconomics between the 2006 baseline and the 2014 end state, which resulted in the reduction of military personnel and dependents, as well as associated indirect and induced impacts. These actions include:

- decommissioning of the KENNEDY in 2007, which alone resulted in gradual loss of approximately 2,498 enlisted and officer personnel (equal to 1,824 net daily population) and their dependents through August 2007;

- downsizing in military personnel at SERMC expected to result in a net decrease of approximately 539 ships maintenance personnel (equal to 540 net daily population since there is no deployment factor for these personnel) and their dependents between 2006 and 2009; and

- decommissioning of 10 FFGs scheduled to begin in 2010 (1 in 2010, 3 in 2012, 3 in 2013, and 3 in 2014), which corresponds to a loss of 215 enlisted and officer personnel (equal to 157 net daily population) and their dependents with each FFG.

To quantify the total impact of the alternatives on employment, income, and base expenditures, the Navy used the IMPLAN model, a regional economic modeling program. The IMPLAN model is based on regional information derived from databases of federal agencies. IMPLAN uses these data on regional industrial spending and trading patterns to estimate the change in expenditures and employment within the local and state economy from a change in the Navy's expenditure of dollars. Impacts are categorized as direct, indirect, or induced impacts. In IMPLAN ROI is termed the local study area and, for this analysis, it was Duval County.

- Direct impacts relate to the actual change in the Navy's expenditures of dollars, whether the expenditure is for new construction, payroll, or other utilities and services that support NAVSTA Mayport. Direct impacts occur within the same industry.

- An indirect impact is the change in purchases made between industries as they respond to the Navy's change in spending.

- An induced impact represents the response by all local industries caused by change in household income expenditures due to the Navy's change in spending.

Refer to Appendix F for additional discussion of the IMPLAN model. In estimating impacts of construction spending, construction cost estimates were rounded to the nearest million dollar figure (USFF 2008).

The estimate of the local tax burden was developed from data produced by the Tax Foundation.[1] The Foundation estimates the current per capita state and local tax burden for Florida is $3,962. The Foundation also estimates nearly 30 percent of the state and local tax burden represents the local tax burden. Therefore, an estimated per capita local tax burden of $1,181 is used in the tax analysis.

As with the 2006 baseline calculations, dependents and school age children were estimated for each alternative based on NAVFAC planning criteria (NAVFAC 2005), which provides criteria and guidance for estimating dependent populations based on the distribution and dependent count data by military grade, and it was assumed that civilians were similarly distributed by civilian equivalent grade and in dependent distribution. Families were assumed to remain in the area regardless of ship deployments and,

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[1] The Tax Foundation was established in 1937 and is located in Washington, DC. The Foundation's mission is to educate taxpayers about tax policy and the size of the tax burden borne by Americans at federal, state and local levels.

therefore, these calculations were based on the total population projections rather than the net daily population projects. See Appendix F for more detail.

4.9.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

4.9.1.1 Demographics

Under the Group 1 alternatives, the personnel gains associated with each alternative would somewhat offset overall losses in NAVSTA Mayport net daily population. There would be minimal construction activity associated with all Group 1 alternatives except for Alternative 2. Estimated losses in net daily population from the 2006 baseline to the 2014 end state have been estimated as detailed in Table 4.9-1. Impacts of losses from decommissioning of the KENNEDY, SERMC downsizing, and decommissioning of the FFGs would be offset to the greatest degree by Alternative 6, followed by Alternative 2, Alternative 5, and Alternative 1. Because the veteran population in the Jacksonville area is largely comprised of Navy personnel that were once stationed at one of the installations in the area, there could be some long-term impacts in the reduction of Navy retirees in the area. However, the trend of decreasing veteran population overall due to the downsizing of the military would be an overriding impact.

Table 4.9-1 Estimated Changes in NAVSTA Mayport Demographics under Group 1 Alternatives

	Net Daily Population		Total Dependents		Total School Age Children	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Alternative 1	-2,800	-21	-5,900	-24	-1,800	-23
Alternative 2	-2,300	-18	-4,900	-20	-1,500	-19
Alternative 5	-2,600	-19	-5,500	-23	-1,700	-21
Alternative 6	-1,200	-9	-2,400	-10	-730	-9

Note: Net Daily Population takes into account deployment factors for ships' crews and other operational personnel (see Table 2.1-2 for details). No such deployment factors are applied to Total Dependents and Total School Age Children. Numbers have been rounded.
Source: calculated based on NAVFAC planning criteria (NAVFAC 2005)

4.9.1.2 Housing

The reduction in the NAVSTA Mayport personnel and dependent population under Group 1 alternatives would decrease demand on housing both on NAVSTA Mayport and in the local community. This is compared to the 2006 baseline. Table 4.9-2 shows the estimated military and contractor/civilians that would require housing under each Group 1 alternative. For the purposes of this analysis, it was assumed that the proportion of military bachelors and families and military and contractor/civilian personnel would remain unchanged from the baseline condition. The 2006 baseline housing requirement identified in the 2006 Housing Requirement Market Analysis (CNIC 2006) is 7,315 military families and 4,877 military bachelors. Reductions in housing demand could increase the housing vacancy rates in the off-Station community, which are generally lower than those of the state and U.S. (see Table 3.9-5).

Table 4.9-2 Estimated Changes in Housing Requirements Under Group 1 Alternatives (Personnel)

	Military Families	Civilian/Contractor Families	Military Bachelor	Civilian/Contractor Bachelors
Alternative 1	-2,000	-160	-1,400	-110
Alternative 2	-1,600	-130	-1,100	-90
Alternative 5	-1,800	-140	-1,300	-100
Alternative 6	-780	-62	-550	-43

Note/Sources: Families calculated from total projected populations (without deployment factors) and breakdown of 41 percent families and 59 percent bachelors at NAVSTA Mayport (CNIC 2006) with assumed equivalent demographics between military families and civilians/contractors. Numbers have been rounded.

The effects of the predicted decrease in housing demand would be experienced both in Navy Family Housing at NAVSTA Mayport, Ribault Bay Village, and Johnson Family Housing, as well as off-Station community housing.

While the average net daily population decreases from the 2006 baseline for each of the Group 1 alternatives, there is an increased need for additional bachelor housing to satisfy current Navy bachelor housing configuration standards in accordance with the Navy's Homeport Ashore Program noted in Section 3.9.4. The specific number of units needed depends on the mixture of ships proposed under each alternative. The existing bachelor housing at NAVSTA Mayport (including barracks currently under construction) would meet the bachelor housing requirement under Alternative 1. However, Alternative 2 would result in a deficit of 103 units, Alternative 5 would result in a deficit of 99 units, and Alternative 6 would result in a deficit of 305 units (Kruciak 2008). The Navy has directed that projected requirements for bachelor housing in the Jacksonville/Mayport area would be accommodated through PPV rather than through construction of additional barracks using MILCON funds. Such PPV housing could be constructed on-Station or off-Station in the community and would be analyzed through separate NEPA documentation associated with the overall PPV housing initiative in the region. This overall PPV housing initiative is independent and separate from the homeporting of additional ships at NAVSTA Mayport. Although there are interrelationships between the housing requirements for NAVSTA Mayport and the homeporting of additional ships, the regional PPV housing initiative would occur regardless of the decision to be made in this EIS. The purpose and need for the regional PPV housing initiative relates to the 1996 Military Housing Privatization Initiative (MHPI) and the DoD goal to leverage private investment with DoD participation, and to use a variety of private sector approaches to build and renovate family housing and ancillary supporting facilities.

4.9.1.3 NAVSTA Mayport Economic Impact

Under Group 1 alternatives, NAVSTA Mayport's economic impact would be reduced as compared to the 2006 baseline, primarily due to the decreased employment at NAVSTA Mayport and its associated payroll expenditures and decrease in annual spending. However, the proposed action would temporarily inject funds into the local economy through expenditures for new construction, although these are considered to be one-time expenditures as opposed to the payroll and installation expenditures, which would be recurring annually.

Table 4.9-3 provides a summary of the regional economic impact (direct, indirect, and induced spending) and the number of jobs that would be created by the one-time expenditure of dollars for the proposed new construction. Under Alternative 2, there would be no construction expenditures. Under the remainder of the Group 1 alternatives, estimated spending would range from $3 to $4 million. A large portion of these funds would be spent on labor and materials purchased in the region, which would be "multiplied" as local merchants and suppliers increase their spending as a result of the increase in demand for their foods and services. This additional spending would continue to cycle through the economy. As shown in Table 4.9-3, the Navy's expenditure of $3 to $4 million would have a regional economic impact of approximately $5 to $7 million. An estimated total of 53 to 70 full- and part-time local jobs would be created under Group 1 alternatives. These jobs would occur primarily in the construction and associated industries throughout the community. The industrial sectors that would be affected the most are the construction, utility, professional services, and wholesale trade sectors.

Table 4.9-3 Estimated Construction Impacts for Group 1 Alternatives

	Alternative 1	*Alternative 2*	*Alternative 5*	*Alternative 6*
Direct Impacts				
Expenditures ($ mil)	$3	$0	$4	$3
Employment (jobs)	33	0	44	33
Indirect Impacts				
Expenditures ($ mil)	$1	$0	$1	$1
Employment (jobs)	9.0	0.0	11	9.0
Induced Impacts				
Expenditures ($ mil)	$1	$0	$1	$1
Employment (jobs)	11	0.0	15	11
Total Impacts				
Expenditures ($ mil)	$5	$0	$7	$5
Employment (jobs)	53	0.0	70	53

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

However, because these construction expenditures represent a one-time expenditure, the resulting positive impacts would be of a short duration. The impacts would occur in 2011 and 2012, the year projects would start and finish. Once these funds leave the regional economy through transfers such as savings, payment of taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

Table 4.9-4 provides a summary of the recurring annual impacts on average annual direct job growth; direct, indirect, and induced impacts on employment; direct payroll; and direct, indirect, and induced disposable income in Duval County by the projected 2014 end state for each of the Group 1 alternatives. Temporary construction impacts presented in Table 4.9-3 are not included in Table 4.9-4. The losses in employment correspond to the net daily population, but are slightly higher because they do not include the deployment factors used to project net daily population estimates. By percent employment in Duval County (see Table 3.9-4), the job losses represent a 0.9 percent decrease for Alternative 1, 0.8 percent decrease for Alternative 2, 0.9 percent decrease for Alternative 5, and 0.4 percent decrease for Alternative 6. Alternative 6 has the lowest average rate of decline due in part to a 4 percent growth in direct jobs in 2009 from the LHD homeporting and declining 2.6 percent per year thereafter. The majority of these jobs would be Navy enlisted and officer personnel assigned to ships homeported at NAVSTA Mayport as well as fluctuations in ships maintenance personnel. As noted in Section 3.9.1, the average annual wage for ships personnel is $20,000 and the average wage for ships maintenance personnel was approximately $30,000 in 2000 dollars.

Table 4.9-4 Estimated Recurring Annual Economic Impacts for Group 1 Alternatives

Impact Category	*Alternative 1*	*Alternative 2*	*Alternative 5*	*Alternative 6*
Average Annual Growth in Direct Jobs – Baseline to 2014				
Growth rate	-3.8%	-3.2%	-3.5%	-1.5%
Change in Employment (jobs)				
Direct	-2,800	-2,300	-2,600	-1,200
Indirect	-330	-270	-300	-140
Induced	-380	-320	-350	-160
Total	-3,500	-2,900	-3,200	-1,500
Change in Payroll ($ million)				
Direct	$ (260)	$ (220)	$ (242)	$ (110)
Change in Disposable Income ($ million)				
Direct	$ (174)	$ (147)	$ (161)	$ (74)
Indirect	$ (35)	$ (30)	$ (33)	$ (15)
Induced	$ (37)	$ (32)	$ (35)	$ (16)
Total	$ (246)	$ (208)	$ (229)	$ (104)

Note: Parentheses denote a negative cash flow. Numbers have been rounded.
Source: IMPLAN

The decrease in military, civilian, and contractor personnel employed at NAVSTA Mayport as compared to the 2006 baseline would result in an annual decrease in the payroll and personal disposable income earned by the residents of the region. The total change in the payroll (earnings plus compensation) ranges from $110 million to $260 million. Disposable income decreases for all Group 1 alternatives resulting in less income recirculated into the local economy. The analysis estimates a reduction of $74 million to $174 million in direct disposable income, which generates an additional $31 million to $72 million reduction in local indirect and induced income. These reductions would impact local economic sectors such as food, housing, clothing, healthcare, and entertainment. It is assumed for this analysis that one-third of payroll expenditures is for taxes and savings. The remaining two-thirds are available for recirculating in the local economy for purchasing goods and services.

As stated in Section 3.9.6, the impact of NAVSTA Mayport on the local economy is estimated at approximately $1.8 billion annually. Additional direct, indirect, and induced impacts would be generated due to base operating expenditures made within the local area. These expenditures include the purchases of goods and services to support NAVSTA Mayport operations. The amount of goods and services that the Station purchases is assumed to change in proportion to the change in the number of personnel who are employed or stationed at NAVSTA Mayport. Due to the decrease employed personnel at NAVSTA Mayport, it is expected that base expenditures would decrease.

The IMPLAN model was used to estimate the impacts NAVSTA Mayport's base expenditures have on the Duval County economy. Base expenditures were estimated from DoD procurement data reported for NAVSTA Mayport in FY06. Procurement contract summary reports, generated from DD-350 reports, list contracts of $25,000 or more. Other expenditures not reported may be paid from other DoD or GSA accounts. The FY06 NAVSTA Mayport contracts were used as the baseline from which per capita expenditures were developed using the baseline NAVSTA Mayport employment figures identified earlier in the report. It is assumed the base expenditures contracted are local if the IMPLAN database identifies Duval County based businesses that are able to perform the required service. The per capita expenditures were applied to the projected employment for the Group 1 alternatives and are presented in Table 4.9-5. The table shows that every $1 million dollars in direct base expenditures would have a regional impact of approximately $1.3 million. The Group 1 alternatives generate 1,100 and more jobs in the regional economy.

Table 4.9-5 Estimated Recurring Annual Base Expenditure Impacts for Group 1 Alternatives

	Alternative 1	*Alternative 2*	*Alternative 5*	*Alternative 6*
Direct Impacts				
Expenditures ($ mil)	$96	$100	$98	$110
Employment (jobs)	820	850	830	940
Indirect Impacts				
Expenditures ($ mil)	$31	$32	$32	$36
Employment (jobs)	300	310	310	350
Induced Impacts				
Expenditures ($ mil)	$2	$3	$3	$3
Employment (jobs)	13	14	13	15
Total Impacts				
Expenditures ($ mil)	$129	$134	$132	$149
Employment (jobs)	1,100	1,200	1,200	1,300

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

The procurement reports for NAVSTA Mayport identify that the shipbuilding and repair industry accounts for 26 percent of the contract values reported. The IMPLAN model estimates this share of direct expenditures generates 18 percent of the direct jobs estimated for each of the Group 1 alternatives.

4.9.1.4 Taxes and Revenues

The reduction of personnel at NAVSTA Mayport as compared to the 2006 baseline would have a negative impact on the generation of tax revenues for Duval County. Because the personnel are assumed to relocate to regions outside of the State of Florida, any taxes these individuals would pay would represent a net decrease in revenues for these jurisdictions. The estimated reduction in local taxes is calculated by multiplying the reduction in population (military and civilian employees, and dependents) by a per capita local tax burden. The change in population for each alternative is shown in Table 4.9-6, along with an estimated local tax burden and resulting reduction in local tax revenue. Estimated reduction in local taxes ranges between approximately $5 to 11 million.

Table 4.9-6 Estimated Recurring Annual Local Tax Impacts for Group 1 Alternatives

	Alternative 1	**Alternative 2**	**Alternative 5**	**Alternative 6**
Population Change	-9,500	-7,900	-8,800	-3,800
Local Per Capita Tax Contribution	$ 1,181	$1,181	$ 1,181	$ 1,181
Estimated Change in Local Tax Contributions ($ million)	$ (11)	$ (9)	$ (10)	$ (5)

Note: Parentheses denotes a negative cash flow. Numbers have been rounded.
Source: USFF 2008, IMPLAN

4.9.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

4.9.2.1 Demographics

As with Group 1 alternatives, the projected losses in the net daily population due to decreases in ships homeported at NAVSTA Mayport under Group 2 alternatives would translate into losses in dependent and school age populations. These losses have been estimated as detailed in Table 4.9-7. Because a visiting CVN would not result in changes to the NAVSTA Mayport population, changes in demographics for Group 2 Alternatives 7, 9, and 11 equate to Group 1 Alternatives 1, 2, and 6, respectively. None of the Group 2 alternatives offset the personnel losses resulting from the decommissioning of the KENNEDY in 2007, SERMC military personnel downsizing (2006 to 2009), or scheduled decommissioning of 10 FFGs beginning in 2010. Over the long term, NAVSTA Mayport would constitute less of the area's population under all of these alternatives, with Alternative 3 having the greatest impact, followed by Alternative 7, Alternative 9, and Alternative 11, which would have considerably less impact. As with Group 1 alternatives, there could be some long-term impacts in the reduction of Navy retirees in the area that would be expected to be minor in the context of the trend of decreasing veteran population overall due to military downsizing.

Table 4.9-7 Estimated Changes in Demographics under Group 2 Alternatives

	Net Daily Population		Total Dependents		Total School Age Children	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Alternative 3	-3,900	-30	-8,500	-35	-2,600	-32
Alternative 7	-2,800	-21	-5,900	-24	-1,800	-23
Alternative 9	-2,300	-18	-4,900	-20	-1,500	-19
Alternative 11	-1,200	-9	-2,400	-10	-730	-9

Note: Net Daily Population takes into account deployment factors for ships' crews and other operational personnel (see Table 2.1-2 for details). No such deployment factors are applied to Total Dependents and Total School Age Children. Numbers have been rounded.
Source: calculated based on NAVFAC planning criteria (NAVFAC 2005)

During times when the CVN is in port, up to 63 days per year for no longer than 21 days at any one time, there would be a short-term influx of approximately 3,140 ships personnel at NAVSTA Mayport and in the local area.

4.9.2.2 Housing

As with Group 1 alternatives, the reduction in the NAVSTA Mayport personnel and dependent population as compared to the 2006 baseline under Group 2 alternatives would decrease demand on housing both on NAVSTA Mayport and in the local community. Again, many of these impacts have already occurred with the decommissioning of the KENNEDY in 2007. Table 4.9-8 shows the estimated military and contractor/civilians that would require housing under each Group 2 alternative. For the purposes of this analysis, it was assumed that the proportion of military bachelors and families and military and contractor/civilian personnel would remain unchanged from the baseline condition. The 2006 baseline housing requirement is 7,315 military families and 4,877 military bachelors (CNIC 2006).

Table 4.9-8 Estimated Changes in Housing Requirements Under Group 2 Alternatives (Personnel)

	Military Families	Civilian/Contractor Families	Military Bachelor	Civilian/Contractor Bachelors
Alternative 3	-2,800	-220	-2,000	-110
Alternative 7	-2,000	-160	-1,400	-90
Alternative 9	-1,700	-130	-1,100	-100
Alternative 11	-780	-62	-550	-43

Note/Sources: Families calculated from total projected populations (without deployment factors) and breakdown of 41 percent families and 59 percent bachelors at NAVSTA Mayport (CNIC 2006) with assumed equivalent demographics between military families and civilians/contractors. Numbers have been rounded.

A visiting CVN is estimated to have a crew of 3,140 persons; however, personnel would remain on the ship and would not require additional housing while in port. It is expected that a visiting CVN would not significantly impact housing at NAVSTA Mayport.

As with the Group 1 alternatives, while the average net daily population decreases from the 2006 baseline for each of the Group 2 alternatives, there is an increased need for additional bachelor housing to satisfy current Navy bachelor housing configuration standards in accordance with the Navy's Homeport Ashore Program noted in Section 3.9.4. The specific number of units needed depends on the mixture of ships proposed under each alternative. The existing bachelor housing at NAVSTA Mayport (including barracks currently under construction), would meet the bachelor housing requirements under Alternative 3 (surplus of 181 units) and Alternative 7 (surplus). However Alternative 9 would result in a deficit of 103 units, and Alternative 11 would result in a deficit of 305 units (Kruciak 2008). As stated in Section 4.9.1.2, deficits in bachelor housing requirements would be met through PPV rather than through construction of additional barracks using MILCON funds. Such PPV bachelor housing could be constructed on-Station or off-Station in the community and would be analyzed through separate NEPA documentation associated with the overall PPV housing initiative in the region. This overall PPV housing initiative is independent and separate from the homeporting of additional ships at NAVSTA Mayport. Although there are interrelationships between the housing requirements for NAVSTA Mayport and the homeporting of additional ships, the regional PPV housing initiative would occur regardless of the decision to be made in this EIS. The purpose and need for the regional PPV housing initiative relates to the 1996 MHPI and the DoD goal to leverage private investment with DoD participation, and to use a variety of private sector approaches to build and renovate family housing and ancillary supporting facilities.

4.9.2.3 NAVSTA Mayport Economic Impact

As with Group 1 alternatives, under Group 2 alternatives NAVSTA Mayport's economic impact would be reduced from the 2006 baseline (prior to the decommissioning of the KENNEDY), primarily due to the decreased employment at NAVSTA Mayport and its associated payroll expenditures and decrease in annual spending. During times when the CVN was in port, however, there would be increased spending in the local economy for periods up to 21 days and up to a total of 63 days per year. Group 2 alternatives also would temporarily inject funds into the local economy through expenditures for new construction, although these are considered to be one-time expenditures as opposed to the payroll and Station expenditures, which would be recurring annually. As with Group 1 alternatives, the economic impact for Group 2 alternatives was analyzed using the IMPLAN model.

Table 4.9-9 provides a summary of the regional economic impact (direct, indirect, and induced spending) and the number of jobs that would be created by the one-time expenditure of dollars for the proposed new construction. The estimated construction impacts were based on the estimated cost of the proposed project costs for each alternative. The estimated direct spending for each of the proposed construction projects for Group 2 Alternative is either $48 million or $51 million (as shown in Table 4.9-9). A large portion of these funds would be spent on labor and materials purchased in the region, which would be "multiplied" as local merchants and suppliers increase their spending as a result of the increase in demand for their foods and services. This additional spending would continue to cycle through the economy. Under all Group 2 alternatives, the Navy's expenditure for $48 to $51 million would have a regional economic impact of approximately $80 to $85 million. An estimated total of 810 to 860 full- and part-time local jobs would be created. These jobs would occur primarily in the construction, dredging, and associated industries throughout the community. The industrial sectors that would be affected the most are the construction, utility, professional services, and wholesale trade sectors.

However, because these construction expenditures represent a one-time expenditure, the resulting positive impacts would be of a short duration. The impacts for the Group 2 alternatives would be generated in 2011and 2012, the years the projects would start and finish. Therefore half these impacts can be assumed to be generated in each of the two years. Once these funds leave the regional economy through transfers such as savings, payment of taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

Table 4.9-9 Estimated Construction Impacts for Group 2 Alternatives

	Alternative 3	Alternative 7	Alternative 9	Alternative 11
Direct Impacts				
Expenditures ($ mil)	$48	$51	$48	$51
Employment (jobs)	490	520	490	520
Indirect Impacts				
Expenditures ($ mil)	$15	$16	$15	$16
Employment (jobs)	150	160	150	160
Induced Impacts				
Expenditures ($ mil)	$17	$18	$17	$18
Employment (jobs)	170	180	170	180
Total Impacts				
Expenditures ($ mil)	$80	$85	$80	$85
Employment (jobs)	810	860	810	860

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

Table 4.9-10 provides a summary of the recurring annual impacts on average growth rate in direct jobs; direct, indirect, and induced employment; direct payroll; and direct, indirect, and disposable income in Duval County by the projected 2014 end state for each of the Group 2 alternatives. The temporary construction impacts presented in Table 4.9-9 are not included in Table 4.9-10. As with Group 2 alternatives, the losses in employment correspond to the net daily population, but are slightly higher because they do not include the deployment factors used to project net daily population estimates. By percent employment in Duval County (see Table 3.9-4), the projected changes in employment represent a 1.3 percent decrease for Alternative 3, 0.9 percent decrease for Alternative 7, 0.8 percent decrease for Alternative 9, and 0.4 percent decrease for Alternative 11. Alternative 3 has the greatest average rate of decline per year, whereas Alternative 11 has the lowest average rate of decline due in part to a 4 percent growth in direct jobs in 2009 from the LHD homeporting and declining 2.6 percent per year thereafter. As with Group 1 alternatives, the majority of these jobs would be Navy enlisted and officer personnel assigned to ships homeported at NAVSTA Mayport as well as fluctuations in ships maintenance personnel. As noted in Section 3.9.1 and 4.9.1, the average annual wage for ships personnel is $20,000 and the average wage for ships maintenance personnel is estimated at approximately $30,000 in 2000 dollars (CNRSE 2001).

Table 4.9-10 Estimated Recurring Annual Economic Impacts for Group 2 Alternatives

Impact Category	***Alternative 3***	***Alternative 7***	***Alternative 9***	***Alternative 11***
Average Annual Growth in Direct Jobs – Baseline to 2014				
Growth rate	-5.7%	-3.8%	-3.2%	-1.5%
Change in Employment (jobs)				
Direct	-3,900	-2,800	-2,300	-1,200
Indirect	-460	-330	-270	-140
Induced	-540	-380	-320	-160
Total	-4,900	-3,500	-2,900	-1,500
Change in Payroll ($ million)				
Direct	$ (370)	$ (260)	$ (220)	$ (110)
Change in Disposable Income ($ million)				
Direct	$ (247)	$ (174)	$ (147)	$ (74)
Indirect	$ (50)	$ (35)	$ (30)	$ (15)
Induced	$ (53)	$ (37)	$ (32)	$ (16)
Total	$ (350)	$ (246)	$ (208)	$ (104)

Note: Parentheses denotes a negative cash flow
Numbers have been rounded.
Source: IMPLAN

The decrease in military, civilian, and contractor personnel employed at NAVSTA Mayport as compared to the 2006 baseline would result in an annual decrease in the payroll and personal disposable income earned by the residents of the region. The total change in the payroll (earnings plus compensation) ranges from $110 million to $370 million. Disposable income decreases for all Group 2 alternatives resulting in less income recirculated into the local economy. The analysis estimates a reduction of $74 million to $247 million in direct disposable income, which generates an additional $31 million to $103 million reduction in local indirect and induced income. These reductions would impact local economic sectors such as food, housing, clothing, healthcare, and entertainment. It is assumed for this analysis that one-third of payroll expenditures is for taxes and savings. The remaining two-thirds would be available for recirculating in the local economy for purchasing goods and services.

As stated in Section 3.9.6 and 4.9.1, the impact of NAVSTA Mayport on the local economy is estimated at approximately $1.8 billion annually. Additional direct, indirect, and induced impacts are generated due to base operating expenditures made within the local area. These expenditures include the purchases of goods and services to support base operations. The amount of goods and services that the Station purchases is assumed to change in proportion to the change in the number of personnel who are employed or stationed at NAVSTA Mayport. Due to the decrease employed personnel at the Station, it is expected that base expenditures would decrease.

While the visiting CVN is in port, there may be a temporary economic impact from the increase in personnel for all Group 2 alternatives. The visiting CVN would be in port a maximum of 63 days per year, with the longest visit of 21 days duration. It is expected that many of the 3,140-person crew would purchase goods and services (e.g., rental cars, gasoline, entertainment, meals, incidentals, sundries, etc.) while in port. Therefore, it is expected that the visiting CVN would temporarily positively impact the economy for the local area.

As with the Group 1 alternatives, the IMPLAN model was used to estimate the impacts NAVSTA Mayport Group 2 alternatives' base expenditures have on the Duval County economy. The DoD procurement data reported for NAVSTA Mayport in FY06 were used as the baseline from which per capita expenditures were developed using the baseline NAVSTA Mayport employment figures identified earlier in the report. It is assumed the base expenditures contracted are local if the IMPLAN database identifies Duval County based businesses that are able to perform the required service. The projected employment numbers for the Group 2 alternatives were multiplied by the per capita expenditures and are presented in Table 4.9-11. The table shows that every $1 million dollars in direct base expenditures would have a regional impact of approximately $1.3 million. This ratio is constant throughout the analyses since the alternative impacts have a linear relationship to the baseline impacts. Base expenditures for the Group 2 alternatives generate a minimum of 1,000 jobs in the regional economy, with Alternative 11 generating approximately 1,300 jobs.

The procurement reports for NAVSTA Mayport identify that the shipbuilding and repair industry accounts for 26 percent of the contracts values reported. The IMPLAN model estimates this share of direct expenditures generates 18 percent of the direct jobs estimated for each of the Group 2 alternatives.

Table 4.9-11 Estimated Recurring Annual Base Expenditure Impacts for Group 2 Alternatives

	Alternative 3	Alternative 7	Alternative 9	Alternative 11
Direct Impacts				
Expenditures ($ mil)	$85	$96	$100	$110
Employment (jobs)	730	820	850	940
Indirect Impacts				
Expenditures ($ mil)	$28	$31	$32	$36
Employment (jobs)	270	300	320	350
Induced Impacts				
Expenditures ($ mil)	$2	$2	$3	$3
Employment (jobs)	12	13	14	15
Total Impacts				
Expenditures ($ mil)	$115	$129	$134	$149
Employment (jobs)	1,000	1,100	1,200	1,300

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

4.9.2.4 Taxes and Revenues

As with Group 1 alternatives, the reduction of personnel at NAVSTA Mayport as compared to the 2006 baseline would have a negative impact on the generation of tax revenues for Duval County. Because the personnel are assumed to relocate to regions outside of the State of Florida, any taxes these individuals would pay would represent a net decrease in revenues for these jurisdictions. The estimation of the reduction in local taxes is calculated by multiplying the reduction in population (military and civilian employees, and dependents) by a per capita local tax burden. The change in population for each alternative is shown in Table 4.9-12 along with an estimated local tax burden and resulting reduction in local tax revenue. The table shows the estimated reduction in local taxes ranges between approximately $5 to 16 million.

Table 4.9-12 Estimated Recurring Annual Local Tax Impacts for Group 2 Alternatives

	Alternative 3	***Alternative 7***	***Alternative 9***	***Alternative 11***
Population Change	-13,700	-9,500	-7,900	-3,800
Local Per Capita Tax Contribution	$1,181	$1,181	$1,181	$1,181
Estimated Change in Local Tax Contributions ($ million)	$ (16)	$ (11)	$ (9)	$ (5)

Note: Parentheses denotes a negative cash flow
Source: USFF 2008, IMPLAN

4.9.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

4.9.3.1 Demographics

Under Alternatives 4 and 8, there would be decreases in the net daily population, dependent, and school age children populations similar to those of Alternatives 6 and 11. With Alternatives 10 and 12 there would be increases to these populations as detailed in Table 4.9-13. The gains would be most pronounced with Alternative 12. These are in comparison to the 2006 baseline and also include personnel losses resulting from the decommissioning of the KENNEDY in 2007, SERMC military personnel downsizing (2006 to 2009), and scheduled decommissioning of 10 FFGs beginning in 2010. During the periodic six-month repair availability for the CVN, there would be an approximately 750 surge in ships maintenance personnel that were not included in the calculations because the first six-month repair availability would occur after the 2014 end state analyzed in this EIS. With the increases under Alternatives 10 and 12, there likely would be long-term increases in Navy retirees in the area that would be expected to be minor in context of the trend of decreasing veteran population overall due to military downsizing.

Table 4.9-13 Estimated Changes in Demographics under Group 3 Alternatives

	Net Daily Population		Total Dependents		Total School Age Children	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Alternative 4	-1,600	-12	-3,300	-13	-1,000	-12
Alternative 8	-430	-3	-690	-3	-210	-3
Alternative 10	5.0	0	300	1	92	1
Alternative 12	1,200	9	2,900	12	890	11

Note: Net Daily Population takes into account deployment factors for ships' crews and other operational personnel (see Table 2.1-2 for details). No such deployment factors are applied to Total Dependents and Total School Age Children. Numbers have been rounded.

Source: calculated based on NAVFAC planning criteria (NAVFAC 2005)

4.9.3.2 Housing

The housing requirements generated by each Group 3 alternative as compared to the 2006 baseline are presented in Table 4.9-14. Given that existing NAVSTA Mayport family housing is at 94 percent occupancy (see Section 3.9), the increase in family housing demand under Alternatives 10 and 12 would be expected to correspond to increasing demand for housing. There are adequate vacancies in the existing off-Station community housing stock to fulfill this demand (see Table 3.9-5), and the growing area housing market would be expected to respond to fulfill the additional demand. The Navy would address any housing shortfalls through the PPV program.

Table 4.9-14 Estimated Changes in Housing Requirements Under Group 3 Alternatives (Personnel)

	Military Families	Civilian/Contractor Families	Military Bachelor	Civilian/Contractor Bachelors
Alternative 4	-1,100	-86	-760	-60
Alternative 8	-230	-18	-160	-13
Alternative 10	100	8.0	69	5.0
Alternative 12	960	76	670	53

Note/Sources: Families calculated from total projected populations (without deployment factors) and breakdown of 41 percent families and 59 percent bachelors at NAVSTA Mayport (CNIC 2006) with assumed equivalent demographics between military families and civilians/contractors. Numbers have been rounded.

As with the Group 1 and 2 alternatives, the Navy has estimated the impact of the Group 3 alternatives on bachelor housing in accordance with the Navy's Homeport Ashore Program noted in Section 3.9.4 and determined (including barracks currently under construction), there would be a deficit in bachelor housing under all Group 3 alternatives. The estimated deficit would be 291 units under Alternative 4; 493 units under Alternative 8; 634 units under Alternative 10; and 837 units under Alternative 12 (Kruciak 2008). As stated in Section 4.9.1.2, deficits in bachelor housing requirements would be met through PPV rather than through construction of additional barracks using MILCON funds. Such PPV bachelor housing could be constructed on-Station or off-Station in the community and would be analyzed through separate NEPA documentation associated with the overall PPV housing initiative in the region. This overall PPV housing initiative is independent and separate from the homeporting of additional ships at NAVSTA Mayport. Although there are interrelationships between the housing requirements for NAVSTA Mayport and the homeporting of additional ships, the regional PPV housing initiative would occur regardless of the decision to be made in this EIS. The purpose and need for the regional PPV housing initiative relates to the 1996 MHPI and the DoD goal to leverage private investment with DoD participation, and to use a variety of private sector approaches to build and renovate family housing and ancillary supporting facilities.

4.9.3.3 NAVSTA Mayport Economic Impact

Under Group 3 alternatives, as compared to the 2006 baseline, NAVSTA Mayport's economic impact would be increased with Alternatives 10 and 12; however, the economic impact would decrease with Alternatives 4 and 8, similar to the other Group 1 and 2 alternatives. The economic impact for Group 3 alternatives was analyzed using the IMPLAN model.

Table 4.9-15 provides a summary of the regional economic impact (direct, indirect, and induced spending) and the number of jobs that would be created by the one-time expenditure of dollars for the proposed new construction. The estimated project costs range between $426 million to $458 million. The $426 million project cost of Alternative 4 would generate $671 million in total expenditures and approximately 7,400 full- and part-time total jobs. The Alternative 4 impacts would be generated between 2011 and 2014, the years this project alternative would start and finish. Therefore, one-quarter of these impacts can be assumed to be generated in each of the four years. The greatest project cost, $458 million, for Alternative 12 generates $722 million in total expenditures and approximately 7,900 total jobs. These jobs would occur primarily in the construction, dredging, and associated industries throughout the community. The industrial sectors that would be affected the most are the construction, utility, professional services, and wholesale trade sectors.

Because these construction expenditures represent a one-time expenditure, the resulting positive impacts would be of a short duration. The impacts of the Group 3 alternatives would be generated between 2011 and 2014, the years these project alternatives would start and finish. Therefore, one-quarter of these impacts can be assumed to be generated in each of the four years. Once these funds leave the regional economy through leakages such as savings, payment of taxes, or purchases of goods and services outside the region, the positive effects would no longer be multiplied.

Table 4.9-15 Estimated Construction Impacts for Group 3 Alternatives

	Alternative 4	*Alternative 8*	*Alternative 10*	*Alternative 12*
Direct Impacts				
Expenditures ($ mil)	$426	$444	$445	$458
Employment (jobs)	5,000	5,200	5,200	5,300
Indirect Impacts				
Expenditures ($ mil)	$91	$96	$96	$100
Employment (jobs)	830	870	870	900
Induced Impacts				
Expenditures ($ mil)	$154	$160	$160	$164
Employment (jobs)	1,600	1,600	1,600	1,700
Total Impacts				
Expenditures ($ mil)	$671	$700	$701	$722
Employment (jobs)	7,400	7,700	7,700	7,900

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

Direct impacts to employment would result from implementation of any Group 3 alternative. The changes correspond to the change in net daily population, but are adjusted to count all jobs regardless of deployment factors. Table 4.9-16 provides a summary of the recurring annual impacts on average growth rate in direct jobs; direct, indirect, and induced employment; direct payroll; and direct, indirect, and induced disposable income in Duval County by the projected 2014 end state for each of the Group 3 alternatives. The economic impacts presented in Table 4.9-16 do not include the temporary construction impacts presented in Table 4.9-15. Alternatives 4 and 8 would be expected to reduce the number of jobs in Duval County, whereas Alternatives 10 and 12 would increase jobs. By percent employment in Duval County (see Table 3.9-4), these represent a 0.5 percent decrease for Alternative 4, 0.1 percent decrease for Alternative 8, no change for Alternative 10, and 0.4 percent increase for Alternative 12. Relatively low growth rates (positive and negative) would occur for the Group 3 alternatives (see Table 4.19-16). This is due to the fluctuations associated with proposed ships homeporting and FFG decommissioning schedules.

As with Group 1 and Group 2 alternatives, the majority of these jobs would be Navy enlisted and officer personnel assigned to ships homeported at NAVSTA Mayport as well as fluctuations in ships maintenance personnel. For Group 3 alternatives, there would be temporary surges of maintenance employees associated with the three-year depot-level maintenance cycle for the CVN. This includes an additional 750 contractor personnel for six months out of the year. The actual date of such maintenance would vary depending on which CVN were homeported, but the first cycle would occur after the 2014 end state for this EIS. As noted in Section 3.9.1 and 4.9.1, the average annual wage for ships personnel is $20,000 and the average wage for ships maintenance personnel is estimated at approximately $30,000 in 2000 dollars (CNRSE 2001).

Table 4.9-16 Estimated Recurring Annual Economic Impacts for Group 3 Alternatives

Impact Category	***Alternative 4***	***Alternative 8***	***Alternative 10***	***Alternative 12***
Average Annual Growth in Direct Jobs – Baseline to 2014				
Growth rate	-2.1%	-0.5%	0.0%	1.4%
Change in Employment (jobs)				
Direct	-1,600	-430	5.0	1,200
Indirect	-190	-50	1.0	140
Induced	-220	-59	1.0	160
Total	-2,000	-530	6.0	1,500
Change in Payroll ($ million)				
Direct	$ (150)	$ (40)	$ 1.0	$ 110
Change in Disposable Income ($ million)				
Direct	$ (100)	$ (27)	$ 0.3	$ 73
Indirect	$ (20)	$ (5)	$ 0.1	$ 15
Induced	$ (22)	$ (6)	$ 0.1	$ 16
Total	$ (141)	$ (38)	$ 0.1	$ 104

Note: Parentheses denotes a negative cash flow. Numbers have been rounded.
Source: IMPLAN

The decrease in military, civilian, and contractor personnel employed at NAVSTA Mayport for Alternatives 4 and 8 as compared to the 2006 baseline would result in an annual decrease in the payroll and personal disposable income earned by the residents of the region. For Alternatives 10 and 12, an increase in personnel as compared to the 2006 baseline would increase the payroll and personal disposable income earned by the residents of the region. The total change in the payroll (earnings plus compensation) ranges from a reduction of $150 million to a gain of $110 million. Disposable income decreases for Alternatives 4 and 8 resulting in less income recirculated into the local economy; however, Alternatives 10 and 12 would increase the disposal income. The greater reduction of $150 million in direct disposable income for Alternative 4 would result in an additional $42 million reduction in local indirect and induced income. This corresponds to a reduction of 410 indirect and induced jobs. The table also shows the greater gain of $73 million in direct disposable income for Alternative 12 generates an additional $31 million in local indirect and induced income. The $31 million corresponds to a gain of 300 indirect and induced jobs. These changes in disposable income would impact local economic sectors such as food, housing, clothing, healthcare, and entertainment. It is assumed for this analysis that one-third of payroll expenditures would be for taxes and savings. The remaining two-thirds would be available for recirculating in the local economy for purchasing goods and services.

As stated in Sections 3.9.6, 4.9.1, and 4.9.2, the impact of NAVSTA Mayport on the local economy is estimated at approximately $1.8 billion annually. Additional direct, indirect, and induced impacts would be generated due to base operating expenditures made within the local area. These expenditures include the purchases of goods and services to support base operations. The amount of goods and services that the Station purchases is assumed to change in proportion to the change in the number of personnel who are employed or stationed at NAVSTA Mayport. Station expenditures are expected to decrease under Alternatives 4 and 8, and increase under Alternatives 10 and 12.

Table 4.9-17 presents the estimated base expenditure impacts generated by the IMPLAN model for the Group 3 alternatives. The per capita expenditures developed from the NAVSTA Mayport FY06 contracts baseline data were multiplied against the employment estimates for each Group 3 alternative and entered into the IMPLAN model. It is assumed the base expenditures contracted are local if the IMPLAN database identifies Duval County based businesses that are able to perform the required service. The table shows that every $1 million dollars in direct base expenditures would have a regional impact of approximately $1.3 million. Base expenditures for the Group 3 alternatives generate a minimum of nearly 1,300 jobs (Alternative 4) in the regional economy, with Alternative 12 generating approximately 1,600 jobs.

Table 4.9-17 Estimated Recurring Annual Base Expenditure Impacts for Group 3 Alternatives

	Alternative 4	***Alternative 8***	***Alternative 10***	***Alternative 12***
Direct Impacts				
Expenditures ($ mil)	$106	$117	$121	$131
Employment (jobs)	910	1,000	1,000	1,100
Indirect Impacts				
Expenditures ($ mil)	$35	$38	$39	$43
Employment (jobs)	340	370	380	420
Induced Impacts				
Expenditures ($ mil)	$3	$3	$3	$3
Employment (jobs)	15	16	17	18
Total Impacts				
Expenditures ($ mil)	$144	$158	$164	$178
Employment (jobs)	1,300	1,400	1,400	1,600

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

The procurement reports for NAVSTA Mayport identify that the shipbuilding and repair industry accounts for 26 percent of the contracts values reported. The IMPLAN model estimates this share of direct expenditures generates 18 percent of the direct jobs estimated for each of the Group 3 alternatives.

4.9.3.4 Taxes and Revenues

The reduction of personnel at NAVSTA Mayport for Alternatives 4 and 8 as compared to the 2006 baseline would have a negative impact on the generation of tax revenues for Duval County; however, the increase in personnel for Alternatives 10 and 12 would have a positive impact as compared to the 2006 baseline. The change in population for each alternative is shown in Table 4.9-18 along with an estimated local tax burden and resulting changes in local tax revenue. The table shows the estimated change in local taxes ranges between a reduction of $6.2 million to a gain of $5.5 million.

Table 4.9-18 Estimated Local Recurring Annual Tax Impacts for Group 3 Alternatives

	Alternative 4	*Alternative 8*	*Alternative 10*	*Alternative 12*
Population Change	-5,300	-1,100	480	4,600
Local Per Capita Tax Contribution	$1,181	$1,181	$1,181	$1,181
Estimated Change in Local Tax Contributions ($ million)	$ (6)	$ (1)	$ 1	$ 6

Note: Parentheses denotes a negative cash flow. Numbers have been rounded.
Source: USFF 2008, IMPLAN

4.9.4 No Action Alternative (Alternative 13)

4.9.4.1 Demographics

The loss in net daily population under the No Action Alternative would result in corresponding losses in the dependent and school age population as compared to the 2006 baseline, as summarized in Table 4.9-19.

Table 4.9-19 Estimated Changes in Demographics under No Action Alternative

	Net Daily Population		**Total Dependents**		**Total School Age Children**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Alternative 13	-3,900	-30	-8,500	-35	-2,600	-32

Note: Net Daily Population takes into account deployment factors for ships' crews and other operational personnel (see Table 2.1-2 for details). No such deployment factors are applied to Total Dependents and Total School Age Children. Numbers have been rounded.
Source: calculated based on NAVFAC planning criteria (NAVFAC 2005)

4.9.4.2 Housing

The decrease in housing demand under the No Action Alternative would decrease demand on housing both on NAVSTA Mayport and in the local community as estimated in Table 4.9-20. As with the other alternatives that would reduce housing demand, reductions in housing demand could increase the housing vacancy rates in the off-Station community, which are generally lower than those of the state and U.S. (see Table 3.9-5).

Table 4.9-20 Estimated Changes in Housing Requirements Under No Action Alternative

	Military Families	**Civilian/Contractor Families**	**Military Bachelor**	**Civilian/Contractor Bachelors**
Alternative 13	-2,800	-220	-2,000	-160

Note/Sources: Families calculated from total projected populations (without deployment factors) and breakdown of 41 percent families and 59 percent bachelors at NAVSTA Mayport (CNIC 2006) with assumed equivalent demographics between military families and civilians/contractors. Numbers have been rounded.

The Navy has estimated the impact of the No Action Alternative on bachelor housing and determined (with the barracks under construction), there would be a surplus of 181 bachelor housing units under the No Action Alternative (Kruciak 2008).

4.9.4.3 NAVSTA Mayport Economic Impact

As with Group 1 and 2 alternatives and Group 3 Alternatives 4 and 8, under the No Action Alternative NAVSTA Mayport's economic impact would be reduced. The IMPLAN model was used to estimate the reduction in annual recurring economic impacts generated by the No Action Alternative. This alternative does not include construction costs and therefore, no economic impacts for the construction sector are estimated.

Table 4.9-21 includes the estimated average annual reduction in direct jobs; direct, indirect, and induced employment; direct payroll; and direct, indirect, and induced disposable income in Duval County in the 2014 end state under the No Action Alternative. Because the recurring annual economic impact is based on employment levels and employment levels under the No Action and Alternative 3 would be the same, the recurring annual impact of the No Action Alternative would be the same as under Alternative 3.

Table 4.9-21 Estimated Recurring Annual Economic Impacts for the No Action Alternative

Impact Category	***No Action Alternative***
Average Annual Growth in Direct Jobs – Baseline to 2014	
Growth rate	-5.7%
Change in Employment (jobs)	
Direct	-3,900
Indirect	-460
Induced	-540
Total	-4,900
Change in Payroll ($ million)	
Direct	$ (370)
Change in Disposable Income ($ million)	
Direct	$ (247)
Indirect	$ (50)
Induced	$ (53)
Total	$ (350)

Note: Parentheses denote a negative cash flow. Numbers are rounded.
Source: IMPLAN

The loss in direct, indirect, and induced employment under the No Action Alternative is estimated at approximately 4,900. By percent employment in Duval County (see Table 3.9-4), this would be an approximately 1.1 percent decrease. As with all action alternatives, the majority of these jobs would be Navy enlisted and officer personnel assigned to ships homeported at NAVSTA Mayport, as well as fluctuations in ships maintenance personnel. The reduction of $247 million in direct disposable income generates additional reductions of $103 million in local indirect and induced income and approximately 1,000 indirect and induced local jobs. As noted in Section 3.9.1 and 4.9.1, the average annual wage for ships personnel is $20,000 and the average wage for ships maintenance personnel is estimated at approximately $30,000 in 2000 dollars (CNRSE 2001).

The IMPLAN model was used to estimate the recurring annual impacts of NAVSTA Mayport base expenditures for the No Action Alternative on the Duval County economy. The base expenditures (estimated by per capita expenditures under the projected No Action Alternative employment) are presented in Table 4.9-22. Recurring annual base expenditures under the No Action Alternative would correspond to approximately 1,000 recurring annual jobs in the regional economy. This would be the same as under Alternative 3 since the 2014 employment levels would be the same under both alternatives.

Table 4.9-22 Estimated Recurring Annual Base Expenditure Impacts for No Action Alternative

	No Action Alternative
Direct Impacts	
Expenditures ($ mil)	$85
Employment (jobs)	730
Indirect Impacts	
Expenditures ($ mil)	$28
Employment (jobs)	270
Induced Impacts	
Expenditures ($ mil)	$2
Employment (jobs)	12
Total Impacts	
Expenditures ($ mil)	$115
Employment (jobs)	1,000

Note: Numbers have been rounded.
Source: USFF 2008, IMPLAN

The procurement reports for NAVSTA Mayport identify that the shipbuilding and repair industry accounts for 26 percent of the contracts values reported. The IMPLAN model estimates this share of direct expenditures generates 18 percent of the direct jobs estimated for the No Action Alternative.

4.9.4.4 Taxes and Revenue

Table 4.9-23 shows the reduction in local tax revenue for the No Action Alternative. The table shows the estimated reduction in local taxes is approximately $16 million.

Table 4.9-23 Estimated Local Recurring Annual Tax Impacts for No Action Alternative

	No Action Alternative
Population Change	-13,700
Local Per Capita Tax Contribution	$1,181
Estimated Change in Local Tax Contributions ($ million)	$ (16)

Note: Parentheses denotes a negative cash flow. Numbers are rounded.
Source: USFF 2008, IMPLAN

4.9.5 Mitigation Measures

No mitigation would be required for socioeconomics under any alternative.

4.10 GENERAL SERVICES

Factors considered in the analysis of potential impacts to general services include:

- Increases in response times for fire/emergency services and law enforcement;
- Increased demand for fire/emergency services and law enforcement, parks and recreation, educational, family services, and medical services; and
- Change in Duval County Schools enrollment

As with the impacts discussion for socioeconomics (Section 4.9), impacts to general services are assessed within the context of other actions affecting NAVSTA Mayport population and associated demand on general services. This includes the approximately 1,824 decrease in the net daily population from the baseline attributed to the decommissioning of the KENNEDY, which was operating at reduced loading at NAVSTA Mayport in the baseline year of 2006, but was decommissioned in March 2007. It also includes the losses associated with SERMC downsizing (2006 to 2009) and scheduled decommissioning of 10 FFGs (beginning in 2010), which are occurring independent of this EIS. Furthermore, in the 1980s and 1990s, manning levels at NAVSTA Mayport were higher than they have been in recent years and much of the general services infrastructure was designed and has the capacity to accommodate an increased base loading.

Specific to education, the decrease in enrollment of federally connected students in schools near NAVSTA Mayport and Johnson Family Housing Area between the 2006/2007 baseline (see Section 3.10.7.2) and the 2007/2008 school year, likely a result of the decommissioning of the KENNEDY, is noted. At the 10 schools near NAVSTA Mayport evaluated in this EIS (see Table 3.10-2), the 2007/2008 enrollment of federally connected students decreased by 38 percent from baseline levels (660 in 2007/2008 as compared to 1,068 in 2006/2007). At the nine schools near the Johnson Family Housing Area evaluated in this EIS (see Table 3.10-3), the 2007/2008 enrollment of federally connected students decreased by 12 percent (436 in 2007/2008 as compared to 498 in 2006/2007) (Eckert 2008).

4.10.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

The loss in the net daily population under all Group 1 alternatives would result in a corresponding loss in the dependent population by 2014 as detailed in Section 4.9 and briefly reiterated below:

- Alternative 1: 2,800 loss in net daily population (21 percent loss from baseline); 5,900 loss in dependent population (24 percent loss from baseline); and 1,800 loss in school age children (23 percent loss from baseline).
- Alternative 2: 2,300 loss in net daily population (18 percent loss from baseline); 4,900 loss in dependent population (20 percent loss from baseline); and 1,500 loss in school age children (19 percent loss from baseline).
- Alternative 5: 2,600 loss in net daily population (19 percent loss from baseline); 5,500 loss in dependent population (23 percent loss from baseline); and 1,700 loss in school age children (21 percent loss from baseline).
- Alternative 6: 1,200 loss in net daily population (9 percent loss from baseline); 2,400 loss in dependent population (10 percent loss from baseline); and 730 loss in school age children (9 percent loss from baseline). However, it should be noted that under this alternative there would be a short-term gain in net daily population gain in excess of baseline from 2009 to 2011, ranging from approximately 550 in 2009 to 400 in 2011. Corresponding gains in dependent and school age children population would occur for this time period.

4.10.1.1 Law Enforcement and Fire and Emergency Services

Under all Group 1 alternatives, the end state population would result in a decrease in demand for law enforcement and fire/emergency services. Response times would not be negatively affected by the decrease.

Under Alternative 6, there would be a temporary increased demand on these resources from 2009 to 2011. This increased demand could occur both on- and off Station based upon the distribution of Navy personnel, their families, and NAVSTA Mayport civilian personnel living in the community. Existing law enforcement and fire/emergency services are currently adequate to meet the demands of NAVSTA Mayport and community. The size of these service departments would be expected to grow as needed to accommodate any increase in demand for service. Because of the dispersed nature of the anticipated increase in demand under Alternative 6 and the offset that would occur from the projected end state population decrease, impacts are anticipated to be minimal. The response times would not increase beyond acceptable levels and the accepted service standards would be maintained.

4.10.1.2 Health Services

The average net daily population at NAVSTA Mayport is expected to decrease with Group 1 alternatives, which would not affect the medical services provided by the Naval Branch Healthcare Center and the Duval County Public Health Unit. Although there would be a temporary gain in population under Alternative 6, health services at NAVSTA Mayport and the surrounding community are more than adequate to accommodate the temporary additional demand for service while maintaining service standards. As stated in Section 3.10.3, NAVSTA Mayport has a Naval Branch Healthcare Center that provides dental and primary care management for military dependents and their families, and there are numerous hospitals providing both inpatient and outpatient care in the Jacksonville vicinity. The Naval Branch Healthcare Center is a new facility that is nearly double the size of the former healthcare facility.

4.10.1.3 Recreation

Although NAVSTA Mayport offers a variety of MWR activities and facilities, NAVSTA Mayport currently has a shortfall in outdoor playing fields and a deficiency in gymnasium space. Group 1 alternatives propose an average net daily decrease in population, which may relieve some of the deficiencies for physical fitness. The temporary gain in the net daily population and associated dependents under Alternative 6 could place additional demand on recreational facilities at NAVSTA Mayport. However, NAVSTA Mayport has planned for a physical fitness addition that, if funded and constructed, would address deficiencies. Additionally, there are numerous recreational facilities and parks scattered throughout the local community (see Section 3.2) and these facilities and parks would be expected to be able to accommodate any temporary increases in population. Therefore, although there could be minor impacts on recreation facilities on NAVSTA Mayport under Alternative 6, these impacts would be temporary and would be relieved as the population decreases from the baseline in 2014.

4.10.1.4 Family Services

Implementation of Group 1 alternatives would result in a decrease in the average net daily and dependent population at NAVSTA Mayport, resulting in a decrease in demand for family services. Even with the temporary increase in net daily population in 2009 to 2011 with Alternative 6, significant impacts to family services are not anticipated. The Family Services Center located at NAVSTA Mayport has sufficient capacity to meet the demands of the existing population, and if necessary, would increase staffing to accommodate the additional personnel loading. The service capabilities would fluctuate with the population and accepted service standards would be maintained.

4.10.1.5 Childcare

The decrease in average net daily population under Group 1 alternatives would decrease some of the demand upon the Child Development Center and Family Home Child Care program at NAVSTA Mayport. The waiting list times may be reduced, thereby improving the existing level of service. The temporary increase in net daily population and associated dependents under Alternative 6 would be expected to place some increased demand upon childcare services until the lower end state population is reached. As stated in Section 3.10.6, average waiting time for childcare is 6 to 9 months; the temporary increase in population could extend this waiting period due to the additional number of children that would require childcare. However, the Child Development Center and Family Home Child Care program would be expected to grow as necessary to accommodate the increase in demand for service. Therefore, accepted service standards still would be maintained.

4.10.1.6 Education

As described in Section 3.10.7, the analysis of impacts on schools is based on the school-age dependent estimates using NAVFAC planning criteria, which in this case appears to overestimate the number of school age children attending Duval County schools, compared to estimates provided by the school district. This conservative approach results in a “worst case scenario,” which seems appropriate given the high occupancy status and overcrowding observed in Duval County’s school system.

Losses in school age children estimated for Group 1 alternatives would decrease the federally connected student enrollment in and corresponding FEIA funding to Duval County Schools. In comparison to the baseline school age children calculated according to NAVFAC planning criteria, the loss would be most pronounced with Alternative 1 (-23 percent of baseline school age population; -1.5 percent of baseline Duval County Schools enrollment), followed by Alternative 5 (-21 percent of baseline school age population; -1.3 percent of baseline Duval County Schools enrollment), Alternative 2 (19 percent of the baseline school age population; 1.2 percent of baseline Duval County Schools enrollment), and Alternative 6 (-9 percent of baseline school age population; -0.6 percent of baseline Duval County Schools enrollment). Losses would be expected to be most pronounced at those schools that are located near NAVSTA Mayport and Johnson Family Housing, but would also occur throughout the school district as well as in private schools and schools in nearby counties (to a lesser degree). In terms of student enrollment, decreases due to the loss in NAVSTA Mayport personnel would be expected to be somewhat offset by increasing enrollment from the growing suburban/beaches population of the Jacksonville area. As noted in Section 4.10.5, this FEIS provides demographic data to Duval County School District that may be used in development of their enrollment projections, five-year facilities plan, and redistricting planning (see also, Sections 6.10.3 and 6.10.4). The school district would be expected to respond to decreases in FEIA funding by making adjustments to school budgets as needed. Funding for students that are not federally connected would be provided by property taxes.

The short-term increase in personnel under Alternative 6 from 2009 to 2011 would correspond to a short-term increase in federally connected school age children associated with NAVSTA Mayport. Based on NAVFAC planning criteria, the short-term increase of approximately 550 in the net daily population would translate into an estimated 280 school age children. If all students were enrolled in Duval County Public Schools, this would represent a 0.2 percent increase in total enrollment. Therefore, although the impact would not be significant, temporary overcrowding of classrooms, particularly for those schools most closely associated with NAVSTA Mayport, would potentially occur. Currently, all but one Johnson Family Housing area schools are over capacity, but (with the exception of Jacksonville Beach Elementary) Duval County schools near NAVSTA Mayport with the highest share of federally connected students have capacity ranging from nearly 40 percent at Mayport Elementary to about 25 percent at Mayport Middle School (see Section 3.10.7). Affected schools would receive additional FEIA funding during this time period; however, these funds generally do not cover full per-pupil costs received through property taxes because the amount of FEIA available for dispensation by the department depends on Congressional approval. Therefore, the Duval County School District likely would incur additional expenses associated with the projected increase in enrollment during this time period.

4.10.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

All Group 2 alternatives would result in losses in the net daily population at NAVSTA Mayport corresponding to losses in the dependent population as summarized below (see Section 4.10 for more detail):

- Alternative 3: 3,900 loss in net daily population (30 percent loss from baseline); 8,500 loss in dependent population (35 percent loss from baseline); and 2,600 loss in school age children (32 percent loss from baseline).
- Alternative 7: 2,800 loss in net daily population (21 percent loss from baseline); 5,900 loss in dependent population (24 percent loss from baseline); and 1,800 loss in school age children (23 percent loss from baseline).
- Alternative 9: 2,300 loss in net daily population (18 percent loss from baseline); 4,900 loss in dependent population (20 percent loss from baseline); and 1,500 loss in school age children (19 percent loss from baseline).
- Alternative 11: 1,200 loss in net daily population (9 percent loss from baseline); 2,400 loss in dependent population (10 percent loss from baseline); and 730 loss in school age children (9 percent loss from baseline). However, it should be noted that under this alternative there would be a short-term gain in net daily population in excess of the baseline from 2009 to 2011, ranging from approximately 550 in 2009 to 400 in 2011. Corresponding gains in dependent and school age children population would occur for this time period. (This is the same as for Alternative 6.)

4.10.2.1 Law Enforcement and Fire and Emergency Services

The impacts of Group 2 alternatives to law enforcement and fire and emergency services would be the same as described for Group 1 alternatives, with Alternative 6 and Alternative 11 having parallel impacts related to the temporary increase in the NAVSTA Mayport population under these alternatives. During periods of time when a CVN is visiting, there would be temporary increases in law enforcement and fire and emergency services associated with the approximately 3,140-person crew. These services would be notified when a CVN is visiting and would be expected to make necessary adjustments to their operations to accommodate the increased demand. It is expected that service standards and response times would not be affected and law enforcement and fire and emergency services would have appropriate protocols and response procedures that account for the additional hazards and security considerations associated with a CVN. Refer to Chapter 5 for law enforcement and fire/emergency services impact analysis as it relates to radiological hazards associated with a visiting CVN.

4.10.2.2 Health Services

Impacts to health services under Group 2 alternatives would be similar to those described for Group 1 alternatives. The impact of the temporary gain in net daily population from 2009 to 2011 for Alternative 11 would be the same as described for Alternative 6 under Group 1.

During periods of time when a CVN is visiting, there could be increased demands for health services. The health services infrastructure on- and off-Station would be expected to be sufficient to accommodate the temporary and transient demand associated with the visiting CVN.

4.10.2.3 Recreation

Impacts to recreation under Group 2 alternatives would be similar to those described for Group 1 alternatives. The impact of the temporary gain in net daily population from 2009 to 2011 for Alternative 11 would be the same as described for Alternative 6 under Group 1. When the CVN is visiting NAVSTA Mayport, there could be increased demand for recreation facilities. During these temporary and intermittent time periods, there likely would be overcrowding at the physical fitness center under Alternative 11 unless the addition that NAVSTA Mayport has planned for is programmed and implemented. Other MWR facilities on-Station are adequately sized for a population that included a CV and, therefore, would be adequate for accommodating the visiting CVN population. The recreational facilities and parks in the local community (see Section 3.2) would be expected to be able to accommodate any temporary increases in demand.

4.10.2.4 Family Services

The impacts to family services from Group 2 alternatives would be the same as described for Group 1 alternatives. The impact of the short-term increase in NAVSTA Mayport population between 2009 and 2011 with Alternative 11 would be the same as described for Alternative 6 under Section 4.10.1.

4.10.2.5 Childcare

The impacts to childcare from Group 2 alternatives would be the same as described for Group 1 alternatives. The impact of the short-term increase in NAVSTA Mayport population between 2009 and 2011 with Alternative 11 would be the same as described for Alternative 6 under Section 4.10.1.

4.10.2.6 Education

The impacts to schools under Group 2 alternatives would be as described for Group 1 alternatives (see Section 4.10.1). In comparison to the baseline school age children calculated according to NAVFAC planning criteria, losses in school age children would be most pronounced with Alternative 3 (-32 percent of baseline school age population; -2.1 percent of baseline Duval County Schools enrollment), followed by Alternative 7 (-23 percent of baseline school age population; -1.5 percent of baseline Duval County schools enrollment), Alternative 9 (-19 percent of baseline school age population; -1.2 percent of Duval County schools enrollment), and Alternative 11 (-9 percent of baseline school age population; -0.6 percent of baseline Duval County schools enrollment). Between 2009 and 2011, there would be a temporary increase associated with the temporary gain in net daily population under Alternative 11. The impact would be the same as described for Alternative 6 in Section 4.10.1. As noted in Section 4.10.5, the Navy would provide demographic data to Duval County School District for their use in development of their enrollment projections and five-year facilities plan.

4.10.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Whereas Alternatives 4 and 8 would result in losses in the net daily population by 2014, Alternatives 10 and 12 would result in personnel gains by 2014. The estimated corresponding changes in the dependent population detailed in Section 4.9 are briefly reiterated below:

- Alternative 4: 1,600 loss in net daily population (12 percent loss from baseline); 3,300 loss in dependent population (13 percent loss from baseline); and 1,000 loss in school age children (12 percent loss from baseline).
- Alternative 8: 430 loss in net daily population (3 percent loss from baseline); 690 loss in dependent population (3 percent loss from baseline); and 210 loss in school age children (3 percent loss from baseline).
- Alternative 10: 5 gain in net daily population (0 percent gain from baseline); 300 gain in dependent population (1 percent gain from baseline), and 92 gain in school age children (1 percent gain from baseline).
- Alternative 12: 1,200 gain in net daily population (9 percent gain from baseline); 2,900 gain in dependent population (12 percent gain from baseline); and 890 gain in school age children (11 percent gain from baseline). There would be a gain in net daily population of 550 in excess of baseline in 2009; 400 in excess of baseline in 2010 and 2011. This would fluctuate to a

decrease of 75 from baseline in 2012 and 550 from baseline in 2013 prior to the end state gain of 1,200 in 2014.

In addition, during the periodic six-month repair availability for the CVN, there would be an approximately 750 surge in ships maintenance personnel that were not included in the calculations because the first six-month repair availability would occur after the 2014 end state analyzed in this EIS.

4.10.3.1 Law Enforcement and Fire and Emergency Services

For Alternatives 4 and 8, there would be an overall decrease in demand on the services of the law enforcement and fire/emergency departments and the impact would be similar as described for Group 1 and Group 2 alternatives. Alternatives 10 and 12 would result in overall long-term increases in demand on law enforcement and fire/emergency services commensurate with the net daily and dependent population increases anticipated with these alternatives. As an indirect impact under Alternatives 10 and 12, manning for NAVSTA Mayport law enforcement and fire and emergency services would be expected to grow in proportion to the increased demand. On-Station law enforcement and emergency facilities would be adequate to accommodate the increased level of demand, which would be less than 10 percent with the exception of Alternative 12. During construction of improvements proposed under Group 3 alternatives, response times for law enforcement and fire and emergency services may be temporarily delayed due to temporary rerouting of roadway traffic. However, personnel would be able to respond via multiple routes. Refer to Chapter 5 for law enforcement and fire/emergency services impact analysis as it relates to homeporting a CVN at NAVSTA Mayport.

4.10.3.2 Health Services

The average net daily population is expected to decrease with Alternatives 4 and 8, which would not affect the medical services provided by the Naval Branch Healthcare Center and the Duval County Public Health Unit. Accepted service standards would be maintained or improved, due to the decrease in NAVSTA Mayport's population.

The Naval Branch Healthcare Center may need to increase its dental and primary care capabilities in proportion with the increases in population resulting from Alternatives 10 and 12. Navy personnel and their families residing outside of NAVSTA Mayport would potentially increase the demand of health services in Duval County to a small degree commensurate with the net daily population and dependent population gain anticipated with these alternatives. The increased demand for health services would likely occur in areas where families are expected to reside, which are generally dispersed throughout

Duval County. In context of the population fluctuations throughout the county and health service flexibility to adjust to population fluctuations, impacts are anticipated to be minimal. Alternatives 10 and 12 would not increase demand for medical services to such a degree that accepted service standards would not be maintained.

4.10.3.3 Recreation

Although NAVSTA Mayport offers a variety of MWR activities and facilities, NAVSTA Mayport currently has a shortfall in outdoor playing fields and a deficiency in gymnasium space. Alternatives 4 and 8 propose a net decrease in population from the baseline, which may relieve some of the deficiencies for physical fitness. NAVSTA Mayport has planned for a physical fitness addition that would address deficiencies and would be able to accommodate future recreational needs at NAVSTA Mayport including the recreational needs of the proposed action's Navy personnel and related NAVSTA Mayport civilian personnel. Additionally, there are numerous recreational facilities and parks scattered throughout the local community (see Section 3.2) and these facilities and parks are expected to be able to accommodate increases in population.

The end state increase in personnel associated with Alternative 12 would have the potential to exacerbate current and foreseeable deficiencies in recreation amenities. Beginning in 2009, existing deficiencies in gymnasium space would be expected to worsen; however, NAVSTA Mayport has planned for a physical fitness addition that would address these deficiencies and this project may be funded and implemented by 2012. The existing gymnasium expansion project may need to be revised to accommodate the projected expanded demand. The shortfall in the requirement for outdoor playing fields would remain unaddressed. Because NAVSTA Mayport is largely built out, the space occupied by playing fields at NAVSTA Mayport has been converted to various facilities and there is not adequate space available to replace the deficit. The increase in demand for recreational facilities would occur to such a great degree that accepted service standards would not be maintained, especially for outdoor playing fields. However, personnel could utilize facilities that are available within the local community to help alleviate some of the increased demand.

4.10.3.4 Family Services

Alternatives 4 and 8 would decrease the average net daily population at NAVSTA Mayport by 1,600 and 430 individuals, respectively, resulting in a lower demand for family services. A greater demand would be placed on the Family Services Center at NAVSTA Mayport with Alternatives 10 and 12 commensurate with the increase in the net daily population under these alternatives. The service would likely grow with the population, with an increase in staffing levels as needed. During the period of temporary surges in population that would during 2009-2011 under Alternative 12, the Family Services Center response times may be affected, but level of service would not be expected to fall below accepted standards. Therefore, although minor adverse impacts could occur, significant impacts would not be anticipated under Group 3 alternatives.

4.10.3.5 Childcare

The decrease in end state population under Alternatives 4 and 8 would decrease some of the demand upon the Child Development Center and Family Home Child Care program. The waiting list times may be reduced and the accepted level of service would be maintained or improved due to the decrease in demand for childcare services.

Waiting time for the on-Station Child Development Center could increase with Alternatives 10 and 12 due to the increase in population and potential number of additional children requiring childcare. However, the Center would be expected to grow as needed to accommodate the additional demand by increasing staffing levels. Also, any additional children may be handled by the Family Home Child Care Program, which generally has more immediate openings than the Center. Off-Station childcare is also available through private companies and home care, and NAVSTA Mayport would work with families to identify these services. Although minor impacts could be expected, the increase in demand for childcare would not occur to such a degree that services standards would not be maintained.

4.10.3.6 Education

Under Group 3 Alternatives 4 and 8, there would be a loss in school age children. Under Alternative 4, there would be a decrease of approximately 1,000 school age children (-12 percent of baseline school age children and -0.8 percent of baseline Duval County school enrollment). Under Alternative 8, there would be a decrease of approximately 210 school age children (3 percent of the baseline school age children and 0.2 percent of the Duval County school enrollment). The resultant impact from Alternatives 4 and 8 would be as described for the decreases associated with Group 1 alternatives (see Section 4.10.1).

Alternatives 10 and 12 would result in a gain in Duval County Schools enrollment, including a 92 gain in school age children under Alternative 10 (+1 percent of baseline school age children, +0.1 percent of baseline Duval County Schools enrollment) and a gain of 890 school age children under Alternative 12 (+11 percent of baseline school age children, +0.7 percent of Duval County School enrollment). The gain for Alternative 10 would not be significant; however, the gain for Alternative 12 could potentially be significant. The magnitude of the Alternative 10 gains would be similar to the impact of the temporary gain associated with Alternatives 6 and 11; however, the duration of the impact would be long-term. The magnitude of the Alternative 12 gains would be greatest and also long-term.

Under Alternatives 10 and 12, there would be potential for overcrowding in Duval County classrooms, particularly those most closely associated with NAVSTA Mayport. According to the 2006/2007 baseline school year, all but one Johnson Family Housing area schools were over capacity, but most Duval County schools near NAVSTA Mayport with the highest share of federally connected students had capacity ranging from nearly 40 percent at Mayport Elementary to about 25 percent at Mayport Middle School (see Section 3.10.7). Affected schools would receive additional FEIA funding; however, these funds generally do not cover full per-pupil costs received through property taxes because the amount of FEIA available for dispensation by the department depends on Congressional approval. Therefore, the Duval County School District likely would incur additional expenses associated with the projected increase in enrollment. Duval County School District develops enrollment projections for all schools in the district for a five-year period. These forecasts are developed utilizing the Duval County Planning Department's county population forecast, other pertinent demographic data, and state cohort projections, and serve as the basis for evaluating facility space and initiating planning activities (Duval County School District 2008). The five-year construction plan calls for construction of one elementary school near Johnson Family Housing and nearly 400 classrooms at 8 schools plus 54 portables throughout Duval County (Duval County School District 2006). Assuming they are funded, these new schools and additional school construction that may occur beyond the timeline of the five-year plan would be expected to alleviate overcrowding As noted in Section 4.10.5, the Navy would provide demographic data to Duval County School District for their use in development of their enrollment projections and five-year facilities plan.

4.10.4 No Action Alternative (Alternative 13)

4.10.4.1 Law Enforcement and Fire and Emergency Services

Under the No Action Alternative, the net daily population is expected to decrease between the baseline and 2014 by approximately 3,900 individuals and the dependent population by approximately 8,500. Overall, the end state population would result in a decrease in demand for law enforcement and fire/emergency services. The decrease in population would not affect services. The response times for law enforcement and fire/emergency services would not increase beyond acceptable levels and the accepted service standards would be maintained or improved, as there would be less of a demand on these resources. Therefore, there would be no impact to these resources as a result of implementing the No Action Alternative.

4.10.4.2 Health Services

The population is expected to decrease under the No Action Alternative, which would not affect the medical services provided by the Naval Branch Healthcare Center and the Duval County Public Health Unit. Accepted service standards would be maintained, or improved as there would be less demand for health services.

4.10.4.3 Recreation

Currently NAVSTA Mayport has a shortfall in outdoor playing fields and a deficiency in gymnasium space. NAVSTA Mayport population would decrease under the No Action Alternative, which may relieve some of these deficiencies.

4.10.4.4 Family Services

Under the No Action Alternative, NAVSTA Mayport population would decrease, resulting in a lower demand for family services. The service capabilities would fluctuate with the population and accepted service standards would be maintained.

4.10.4.5 Childcare

The overall decrease in population that would occur under the No Action Alternative would decrease some of the demand upon the Child Development Center and Family Home Child Care program. The waiting list times may be reduced and the accepted level of service would be maintained, or improved, due to the decrease in demand for childcare service.

4.10.4.6 Education

Under the No Action Alternative, there would be an estimated decrease of approximately 2,600 school age children. This equates to a 32 percent decrease in baseline school age children and 2.1 percent decrease in baseline Duval County Schools enrollment. The impact would be similar to that described for Alternative 3 under Group 2 alternatives (see Section 4.10.2).

4.10.5 Mitigation Measures

The deficiency in gymnasium space resulting from implementation of Alternatives 10 and 12 would be mitigated by NAVSTA Mayport's plans for a physical fitness addition; this project may be funded and implemented by 2012.

Homeporting a CVN in addition to several possible combinations of ships would be expected to increase the need for NAVSTA Mayport security and fire and emergency services. Additional resources could be needed by the law enforcement and fire/emergency departments to meet the additional service requirements. Other general services, particularly health services, family services, and childcare would be expected to grow as needed to alleviate some of the additional demand resulting from any increases in population, and specific mitigation measures would not be needed. To mitigate potential impacts to schools, the Navy would provide assistance to the Duval County School District, to the extent practicable, in their pursuit of FEIA. However, full funding of FEIA is unlikely based on historical funding levels. Additionally, the Navy will provide information on how homeporting of additional ships would potentially change school age populations to Duval County School District for their use in development of the School District's enrollment projections and five-year facilities plan.

4.11 UTILITIES

Direct impacts from the proposed action on utilities could result from the berthing of new surface ships, construction of new facilities, and net change in number of personnel at NAVSTA Mayport. Factors considered in assessing impacts to utilities address the ability of systems to maintain capacity at levels greater than expected peak demand; requirements to develop a new utility system or source; and utility demand that reaches, exceeds, or requires the use of a substantial portion of the existing system capacity.

Utility needs associated with ships homeporting in the various alternatives are incorporated in the proposals and described in Chapter 2. The focus of this analysis is on the change to the overall system demands and infrastructure capabilities.

In order to determine whether potential impacts meet the above-listed threshold criteria, utility demand and infrastructure requirements for the mix of homeported ships under various alternatives, new facilities, and net change in number of personnel were compared to existing infrastructure and utilities demand for each alternatives group below. Military Handbook (MILHDBK) 1025/2, *Dockside Utilities for Ships* and 2003 UFC 4-150-02, *Design: Dockside Utilities for Ship Service* provided baseline data for determining shore requirements for various mixes of ships.

4.11.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

Group 1 alternatives propose homeporting of additional surface ships including the DDG, FFG, LHD, LSD, and LPD. Maintenance and utilities for the proposed new ships would be provided by existing facilities and infrastructure. NAVSTA Mayport already provides such services to DDGs and FFGs; thus, this subsection focuses on utility requirements of new ship classes proposed (LHD, LSD, and LPD) in Alternatives 2, 5, and 6.

4.11.1.1 Energy

Electricity. Table 4.11-1 identifies the power requirements for the new ship types proposed for homeporting in Alternatives 5 and 6. Analysis of the existing power distribution at wharves and electrical specifications of the proposed surface ships, indicate that existing infrastructure can accommodate the berthing power requirements of the new ship types (LSD, LHD, and LPD). In addition, the combination of ships to be homeported under all Group 1 alternatives could be accommodated with existing electrical infrastructure. No new electrical supply sources or connection modifications would be required (McVann 2007b, Malsch 2006).

Table 4.11-1 NAVSTA Mayport Group 1 Alternatives Proposed Ship Berthing Power Demand

Ship Type	Ship Class	Ampacity per Station [1]	Required Ampacity of Shore Power Service [2]
LSD	41	2,400	2,400
	49	3,200	2,160
LHD	1	4,000 4,000 3,200	7,200
LPD	4	1,600	1,400
	17	8,000	8,000

Source: Cole 2007

[1] Capacity is given in amperes. Unless otherwise indicated, power to load center is 450 V, three-phase, three-wire, 60 Hz, ungrounded. Power factor is approximately 0.8. The number of receptacles per station may be obtained by dividing per station capacity by 400.

[2] Required ampacity of shore power service is the maximum power that the ship will demand from the shore power system.

Steam. Table 4.11-2 identifies the steam requirements for the new types of surface ships proposed for homeporting under Group 1 Alternatives 5 and 6. Analysis of the existing steam distribution at the wharves and steam specifications of proposed new surface ships types indicates that existing infrastructure can accommodate the berthing steam requirements of the proposed surface ships. No new steam supply sources or connection modifications would be required for Alternatives 5 and 6 (McVann 2007b, Malsch 2006).

Table 4.11-2 NAVSTA Mayport Group 1 Alternatives Proposed Ship Berthing Steam Demand

New Ship Type	Ship Class	Constant Load (lb/hr)
LSD	41	7,400
	49	7,400
LHD	1	2,500
LPD	4	2,200
	17	Steam not required

Source: Cole 2007

As stated in Section 3.11.1, the existing steam plant has a capacity of 100,000 lbs/hr. Therefore, under all Group 1 alternatives, there would be adequate capacity to serve the increased steam demand. Because the existing infrastructure can accommodate the berthing steam requirements of the additional ships and the increased loading does not exceed existing steam capacity, there would not be significant impacts to the steam supply system.

Compressed Air. The LSD, LHD, and LPD ship types proposed for homeporting under the Group 1 Alternatives 5 and 6 would, like other ships in the Navy inventory, require compressed air at 125 psi (Cole 2007). Analysis of the existing compressed air distribution at the wharves (see Section 3.11.1) and the compressed air specifications of the proposed surface ships indicates that existing infrastructure can accommodate the berthing compressed air requirements of the new ship types. No new compressed air supply sources or connection modifications would be required for Alternatives 5 and 6 (McVann 2007b, Malsch 2006).

Mobile air compressors are used to supply wharves with air as needed to supplement the compressed air provided by the Compressed Air Plant (Building 391). Because portable generators are available and since air is not a limited resource, there would be no impact to the compressed air supply system for any Group 1 alternative.

Fuel Supply. Analysis of the existing fuel distribution at the wharves and fuel supply tanks at the NAVSTA Mayport fuel farm indicate that existing infrastructure can accommodate the berthing fuel supply requirements of the LHD, LPD, and LSD new ship types that would be homeported under Alternatives 5 and 6. No new fuel supply sources or connection modifications would be required (McVann 2007b). The on-site fuel supply capacity would not be affected by any new combination of ships. Therefore, there would be no significant impact to the fuel supply system for any Group 1 alternative.

4.11.1.2 Potable Water

Table 4.11-3 identifies the potable water requirements for the surface ships proposed for homeporting in the Group 1 alternatives. Analysis of the existing potable water distribution at the wharves and the potable water specifications of the new surface ships types under Alternatives 5 and 6 indicates that existing infrastructure can accommodate the berthing potable water requirements of the proposed surface ships. No new potable water supply sources or connection modifications would be required (McVann 2007b, Malsch 2006).

Table 4.11-3 NAVSTA Mayport Group 1 Alternatives Proposed Potable Water Demand at Berth

New Ship Type	Ship Class	Normal Requirement with Ships Compliment (GPD)	Requirement with Troops Aboard (GPD)
LSD	41	14,000	25,000
	49	12,000	25,000
LHD	1	32,000	90,000
LPD	4	15,000	48,300
	17	15,000	40,000

Source: Cole 2007

Group 1 alternatives would result in an overall decline in the net daily population of personnel, resulting in an overall reduction in potable water demand. Of the Group 1 alternatives, Alternative 6 has the least number of personnel reductions, decreasing the net daily population by approximately 1,200 personnel. The potable water system is currently running at about 25 percent of capacity using an average of 2.3 mg/d with a 10 mg/d capacity (USEPA 2006b). Based on a potable water demand of 50 GPD per person (DoN 1997), the volume would be reduced by approximately 60,000 GPD by the 2014 end state. The remaining alternatives in Group 1 would all result in potable water demand reductions of a greater magnitude than Alternative 6. Because the existing infrastructure can accommodate the berthing potable water distribution requirements of the new ship types and since there would be a decrease loading on potable water, no significant impact to the potable water system would result from implementation of any Group 1 alternative.

4.11.1.3 Sanitary Sewer

Table 4.11-4 identifies the sanitary sewer discharge requirements for the new surface ship types proposed for homeporting in Alternatives 5 and 6. Analysis of the existing sewer collection system at the wharves and the discharge specifications of the proposed surface ships indicate that existing infrastructure can accommodate the berthing sanitary sewer discharge requirements of these new ship types. No new sanitary sewer collection sources or connection modifications would be required (McVann 2007b).

Table 4.11-4 NAVSTA Mayport Group 1 Alternatives Proposed Ship Sanitary Sewer Discharge at Berth

Ship Type	Ship Class	Pump Station	Pump	Pump Rating (GPM)	Number of Discharge Connections
LSD	41	1	1A	100	2
			1B	100	
		2	2A	100	
			2B	100	
	49	1	1A	100	2
			1B	100	
		2	2A	100	
			2B	100	
LHD	1	1	1A	300	4
			1B	300	
		2	2A	300	
			2B	300	
LPD	4	1	1A	150	4
			1B	150	
		2	2A	150	
			2B	150	
	17	1	1A	120	4
			1B	120	
		2	2A	120	
			2B	120	
		3	3A	200	
			3B	200	
		4	4A	200	
			4B	200	

Source: Cole 2007
Note: GPM = Gallons Per Minute

Group 1 alternatives result in an overall decline in the net daily population of personnel, resulting in an overall reduction in sanitary sewer discharge being processed by the DWTP. Of the Group 1 alternatives, Alternative 6 has the least number of personnel reductions, decreasing the number by approximately 1,200 personnel. Based on a generation rate of 50 GPD per person (DoN 1997), the sanitary sewer discharge volume would be reduced by approximately 60,000 GPD by the 2014 end state. When the dependent population is considered, the volume would be reduced to an even greater extent. The remaining alternatives in Group 1 all would result in discharge reductions of a greater magnitude than Alternative 6. Because the existing infrastructure can accommodate the berthing sanitary sewer discharge requirements of the LSD, LHD, and LPD and since there would be a decreased loading to the sanitary system, no significant impact to the sanitary sewer system would result with implementation of any of the Group 1 alternatives.

4.11.1.4 Wastewater (Industrial and Oily)

Table 4.11-5 identifies the wastewater discharge requirements for the new surface ships types proposed for homeporting in the Group 1 alternatives. Analysis of the existing wastewater collection system at the wharves and the discharge specifications of the proposed surface ships indicate that existing infrastructure would be able to accommodate the berthing wastewater discharge requirements of the new surface ship types. No new treatment sources or connection modifications would be required (McVann 2007b, Malsch 2006).

Table 4.11-5 NAVSTA Mayport Group 1 Alternatives Proposed Ship Berthing Wastewater Discharge

New Ship Type	Ship Class	Pump Station	Pump	Pump Rating, (GPM)	Quantity Peak, (GPD)	Quantity Average (GPD)
LSD	41	N/A	N/A	N/A	4,800	2,700
	49	N/A	N/A	N/A	4,800	2,700
LHD	1	1	1A	54	21,000	6,400
			1B	54		
			1C	54		
LPD	4	1	1A	18	21,00	6,400
		2	2A	90		
	17	1	1A	54	21,000	6,400
		N/A	1B	54		
		2	2A	10		
		3	3A	10		

Source: Cole 2007
Note: N/A = not available; GPM = Gallons Per Minute; GPD = Gallons Per Day

Of the Group 1 alternatives, the combination of ships in Alternative 6 add up to generate the highest average volume of wastewater at 53,300 GPD. This would be a reduction of 52,200 GPD below the 105,500 GPD of wastewater generated from the existing combination of berthed ships. The OWTP collection and treatment facilities have a design capacity of 0.288 mg/d. Because the existing infrastructure can accommodate the wastewater discharge requirements of the additional ships and since there would be a decreased loading to the OWTP, no significant impact to industrial and oily wastewater would result with implementation of any Group 1 alternative.

4.11.1.5 Stormwater

The DESRON headquarters building to be constructed under Alternatives 1 and 6 and the PHIBRON headquarters building to be constructed under Alternative 5 would have highly localized impacts to stormwater at this previously disturbed 0.5-acre site. The site is located in a basin designated as Basin C in the NAVSTA Mayport SWPPP. At 1,697 acres, this basin is the largest single drainage basin on NAVSTA Mayport. It encompasses the housing areas at the southeast portion of the base; a large portion of the recreational areas, a large area of the golf course and approximately one half of the base runway areas. Drainage patterns within the portion of this basin east of Maine Street flow generally towards Lake Wonderwood (NAVFAC Southeast 2006). The only existing outfall from Lake Wonderwood is to prevent flooding of the housing area. This outfall seldom discharges except during major storm events or high rainfall periods.

Although approximately 20 percent of the site for the headquarters building currently is impervious surface due to prior development, some additional impervious surface would occur as a result of development. The Navy's Low Impact Development (LID) policy sets the goal of no net increase of stormwater volume, sediment, and nutrient loading from major renovation or construction projects, and implements the most cost-effective storm water treatment techniques. LID requires construction projects to imitate a site's predevelopment hydrology with design techniques that infiltrate, filter, store, evaporate, or retain runoff close to its source. Instead of conveying and treating storm water in large, costly end-of-pipe facilities located at the bottom of drainage areas, LID addresses stormwater through small, cost-effective landscape features located at the site. Landscape designs include structural elements such as planted swales and bio-retention areas to capture rainwater where it can be absorbed or evaporated on site, rain barrels which store water and release it slowly, and permeable pavers which allow water to pass through paved areas into the ground (Navy Office of Information 2008). UFC 3- 210-10, *Low Impact Development*, provides guidelines for integrating LID stormwater strategy into planning and design of facilities (DoD 2004).

In order to comply with the regulations on TMDLs issued in December 2007, new impervious discharge would need to be evaluated and mitigation implemented to prevent additional nutrients from entering receiving waters. The western boundary of the site identified for the DESRON or PHIBRON headquarters building is a ditch that conveys stormwater south towards the golf course. As noted in Section 3.11.4, NAVSTA Mayport's Phase II MS4 Permit constitutes authorization to discharge stormwater from urbanized areas and construction activities (1 to 5 acres) to surface waters. Because the area of potential development is less than one acre, a Construction Generic Permit would not be required

(NAVFAC Southeast 2006). If, however, in the design phase for these facilities, it is found that the area of potential disturbance disturb greater than one acre of soil (including lay-down, ingress and egress areas), an FDEP Construction Generic Permit would be required along with a Notice of Intent, a Notice of Termination, and a construction site SWPPP. The facility design would include stormwater drainage structures to address long term water runoff from impermeable surfaces. Based on the most current design plans, it is expected that an Environmental Resource Permit for Stormwater Management Systems would be required for the construction of the PHIBRON or the DESRON headquarters and associated paved parking areas since the proposed impervious surface is greater than 9,000 sf (FAC 40C-42.022). The MS4 management plans and goals may have to be modified to address the new impervious surface activities and, if such modifications affect how allocations would be accomplished, FDEP approval would be sought. The existing stormwater infrastructure would be upgraded to either treat and remove nutrients in stormwater or prevent stormwater from reaching receiving waterways so no significant impact to the stormwater system would result (Dombrosky 2007).

4.11.1.6 Solid Waste

The collection process of solid waste for disposal at the wharves is the same for all ships, utilizing the existing dumpsters already in place at the wharves. No new solid waste dumpsters would be required for any Group 1 alternatives (McVann 2007b). Group 1 alternatives would result in an overall decline in the net daily population of personnel, resulting in an overall reduction in solid waste generated by the working and dependent population. Of the Group 1 alternatives, Alternative 6 has the least number of personnel reductions, decreasing the net daily population of nondeploying personnel by 470 and decreasing the number of ships personnel in port by 703. Based on an estimated generation rate of 8.7 lbs/day for nondeploying person and 3.7 lbs/day for ships personnel (DoN 1995), the solid waste volume generated would be reduced by approximately 6,700 lbs/day by the 2014 end state. There would be a commensurate reduction in waste generated by fewer dependents. The remaining alternatives in Group 1 would all result in solid waste reductions of a greater magnitude than Alternative 6. Because the existing infrastructure would accommodate the berthing solid waste disposal requirements of the mix of homeported ships and since there would be a decrease in solid waste for all Group 1 alternatives, no significant impact to solid waste disposal would result.

4.11.2 Group 2 Alternatives (Alternative 3, 7, 9, and 11)

This group of alternatives proposes to homeport various combinations of up to three types of surface ships (i.e., DDG, FFG, LHD), in addition to providing unrestricted capability for a visiting CVN to be berthed at Wharf C-2. This subsection focuses on the impacts to utilities of CVN capability, while also considering the loading impacts of additional surface ships proposed for homeporting in Group 1 alternatives described in Section 4.11.1.

4.11.2.1 Energy

Electricity. Table 4.11-6 identifies the berthing power requirements for the CVN. Necessary upgrades were made in 2002 to Wharf C-2 to meet these requirements. Analysis of the existing power distribution at Wharf C (see Section 3.11.1) and the electrical specifications of the CVN indicate that existing infrastructure would be capable of accommodate the berthing power requirements. No new electrical supply sources or connection modifications would be required (McVann 2007b, Malsch 2006).

Table 4.11-6 NAVSTA Mayport CVN Power Demand at Berth

Ship Type	Ship Class	Number of Stations	Ampacity per Station [1]	Required Ampacity of Shore Power Service [2]
CVN	65	1	3,200	8,600
	68, 69	1	1,440 1,440 4,000 4,000 4,000 4,000	2,800 16,000
	70-76	1 1 2 2	1,440 1,440 4,000 4,000	2,800 16,000

Source: Cole 2007

[1] Capacity is given in amperes. Unless otherwise indicated, power to load center is 450 V, three-phase, three-wire, 60 Hz, ungrounded. Power factor is approximately 0.8.

[2] Required ampacity of shore power service is the maximum power that the ship will demand from the shore power system. The shore power service transformer shall be sized to provide the “required ampacity of shore power service” for the ship moored at the respective berth

The Group 2 alternative with the maximum demand for power is Alternative 11, with 17 surface ships homeported in the 2014 end state. The average demand from these ships would be less than the baseline demand of 22 homeported ships. Therefore, with no new connection upgrades required and the lack of a substantial increase in net power demand, there would be no significant impacts to electricity from implementation of any of the Group 2 alternatives.

Steam. A CVN requires steam at a constant load of up to 7,000 lb/hour (Cole 2007). Analysis of the existing steam distribution at Wharf C and the steam specifications of the CVN indicate that existing infrastructure would be capable of accommodating the berthing steam requirements of the Group 2 alternatives. No new steam supply sources or connection modifications would be required (McVann 2007b, Malsch 2006). As stated in Section 3.11, the existing steam plant has a capacity of 100,000 lbs/hr, which is adequate to serve the increased steam demand related to the Group 2 alternatives. Therefore, no significant impacts would occur to steam under any of the Group 2 alternatives.

Compressed Air. A visiting CVN proposed for berthing in the Group 2 alternatives would require compressed air at 125 psi. Analysis of the existing compressed air distribution at Wharf C and CVN compressed air specifications indicates that existing infrastructure can accommodate the berthing compressed air requirements of the proposed CVN. Mobile air compressors are used to supply wharves with air as needed to supplement the compressed air provided by the Compressed Air Plant (Building 391). Because portable generators are available and since air is not a limited resource, there would be no significant impact to the compressed air supply.

Fuel Supply. Analysis of the existing fuel distribution at Wharves C and F and NAVSTA Mayport fuel farm supply tanks indicates that existing infrastructure can accommodate the berthing fuel supply requirements relative to DFM and JP-5. The increased demand in jet fuel associated with the CVN would be offset by the decommissioning of the KENNEDY. No new fuel supply connection modifications would be required for being CVN capable (McVann 2007b). The on-site capacity would not be affected by any new combination of ships. Therefore, there would be no impact to the fuel supply system for any Group 2 alternatives.

4.11.2.2 Potable Water

Table 4.11-7 identifies the potable water requirements for the CVN that would be required for a visiting CVN under the Group 2 alternatives. Analysis of the existing potable water distribution at the wharves and the potable water specifications of a CVN in port indicate that existing infrastructure can accommodate the berthing potable water requirements of the proposed surface ships. No new potable water supply sources or connection modifications would be required (McVann 2007b).

Table 4.11-7 NAVSTA Mayport CVN Potable Water Demand at Berth

Ship Type	Ship Class	Normal Requirement with Ships Compliment (GPD)	Requirement with Air Wing (GPD)
CVN	65	100,000	140,000
	68	100,000	185,000

Source: Cole 2007
Note: GPD = Gallons Per Day

All Group 2 alternatives would result in an overall decline in the net daily population of personnel, resulting in an overall reduction in potable water demand. Of the Group 2 alternatives, Alternative 11 has the least number of personnel reductions, decreasing the net daily population by approximately 1,200 personnel and having a commensurate decrease in the number of dependents. The potable water system currently is running at about 25 percent of capacity using an average of 2.3 mg/d with a 10 mg/d capacity. Based on a potable water demand of 50 GPD per person, the volume would be reduced by approximately 60,000 GPD by the 2014 end state. The remaining alternatives in Group 2 would all result in potable water demand reductions of a greater magnitude than Alternative 11. Because the existing infrastructure can accommodate the berthing potable water distribution requirements of the additional ships and since there would be a decrease loading on potable water, there would be no significant impact on the potable water system under the Group 2 alternative.

In addition to requiring potable water, Wharf C-2 would also require pure water for specific CVN mechanical operations, should it remain in port for longer than a period of seven days. Since no pure water is available at Wharf C-2, pure water would be supplied by tanker truck as required.

4.11.2.3 Sanitary Sewer

Table 4.11-8 identifies the sanitary sewer discharge requirements for the CVN. Analysis of the existing sewer collection system at Wharf C-2 and the discharge specifications of the CVN indicate that existing infrastructure can accommodate the berthing sanitary sewer discharge requirements for Group 2 alternatives. No new sanitary sewer collection sources or connection modifications would be required (McVann 2007b).

All Group 2 alternatives would result in an overall decline in the net daily population of personnel, resulting in an overall reduction in sanitary sewer discharge being processed by the DWTP. Of the Group 2 alternatives, Alternative 11 has the least number of personnel reductions, decreasing the net daily population by approximately 1,200 personnel. Based on a generation rate of 50 GPD per person, the sanitary sewer discharge volume would be reduced by approximately 60,000 GPD by the 2014 end state. Additional decreases would occur as a result of decreases in the dependent population. The remaining alternatives in Group 2 all would result in discharge reductions of a greater magnitude than Alternative 11. Because the existing infrastructure can accommodate the berthing sanitary sewer discharge requirements of the additional ships and since there would be a decreased loading to the sanitary system, there would be no sanitary sewer system under the Group 2 alternatives.

Table 4.11-8 NAVSTA Mayport CVN Sanitary Sewer Discharge at Berth

Ship Type	Ship Class	Pump Station	Pump	Pump Rating (GPM)	Number of Discharge Connections
CVN	65	1	1A	400	6
			1B	400	
		2	2A	400	
			2B	400	
		3	3A	400	
			3B	400	
		4	4A	400	
			4B	400	
		5	5A	400	
			5B	400	
		6	6A	400	
			6B	400	
		7	7A	400	
			7B	400	
	68-71	1	1A	400	4
			1B	400	
		2	2A	400	
			2B	400	
		3	3A	400	
			3B	400	
	72-77	1	1A	400	4
			1B	400	
		2	2A	400	
			2B	400	

Source: Cole 2007
Note: GPM = Gallons Per Minute

4.11.2.4 Wastewater (Industrial and Oily)

Table 4.11-9 identifies the wastewater discharge requirements for the CVN. Analysis of the existing wastewater collection system at Wharf C and the discharge specifications of the CVN indicate that existing infrastructure can accommodate the berthing wastewater discharge requirements of the Group 2 alternatives. No new treatment sources or connection modifications would be required (McVann 2007b). Because the existing infrastructure can accommodate the wastewater discharge requirements of the additional ships, there would be no significant impact to the industrial and oily wastewater under any Group 2 alternatives.

Table 4.11-9 NAVSTA Mayport CVN Berthing Wastewater (Industrial and Oily) Discharge

Ship Type	Ship Class	Pump Station	Pump	Pump Rating (GPM)	Qpeak (GPD)	Qave (GPD)	Number of Discharge Connections
CVN	65	1	1A	200	35,000	35,000	2
			1B	200	80,000	35,000	
	68-71	1	1A	90	80,00	35,000	2
	72-77	1	1A	90	80,000	35,000	N/A
			1B	90	80,000	35,000	

Source: Cole 2007
Note: N/A = not available; GPM = Gallons Per Minute; GPD = Gallons Per Day

4.11.2.5 Stormwater

Alternatives 7 and 11 would require the construction of a DESRON headquarters building that would disturb an estimated 0.5-acres at the same previously disturbed site discussed for Alternatives 1, 5, and 6 under the Group 1 alternatives. The assessment for stormwater for these alternatives detailed in Section 4.11.1.5 would apply equally to Alternatives 7 and 11 and impacts to stormwater would not be significant.

4.11.2.6 Solid Waste

The collection process of solid waste for disposal at the wharves is the same for all ships, utilizing the existing dumpsters already in place at the wharves. No new solid waste dumpsters would be required for any of the Group 2 alternatives (McVann 2007b).

Group 2 alternatives would result in an overall decline in the net daily population of personnel, resulting in an overall reduction in solid waste generated. Of the Group 2 alternatives, Alternative 11 has the least number of personnel reductions, decreasing the number of nondeploying personnel by 470 and decreasing the number of ships personnel in port by 703. Based on an estimated generation rate of 8.7 lbs/day for nondeploying person and 3.7 lbs/day for ships personnel, the solid waste volume generated would be reduced by approximately 6,700 lbs/day by the 2014 end state. Further reductions would occur due to decreases in the dependent population. The remaining alternatives in Group 2 would all result in solid waste reductions of a greater magnitude than Alternative 11. Because the existing infrastructure can accommodate the berthing solid waste disposal requirements of the additional ships and since there would be a decrease in solid waste reduction for all Group 2 alternatives, there would be no significant impact to solid waste disposal under Group 2 alternatives.

4.11.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

Group 3 alternatives propose to homeport various combinations of up to three types of surface ships (i.e., DDG, FFG, LHD), in addition to homeporting a CVN. This subsection focuses on the impacts to utilities of homeporting a CVN, including the construction and operation of the CVN nuclear propulsion plant maintenance facilities and use of Wharf F for CVN maintenance. Impacts resulting from changes in base loading also are considered.

4.11.3.1 Energy

Electricity. In addition to meeting the berthing requirements for a CVN, the Group 3 alternatives would require Wharf F upgrades to accommodate the electrical demand associated with CVN maintenance. These upgrades, which would be part of the proposed action of all Group 3 alternatives, are detailed herein. The total design load requirement at Wharf F under Group 3 is estimated at 30,000 kilovolt-amps (kVA). The present 480-volt shore power facilities have a design capacity of approximately 7,500 kVA. Electrical utility modifications at Wharf F would require the expansion of the existing 480-volt shore power stations and installation of a 4160-volt shore power station (DoN 1997). Specific distribution upgrades include oil circuit breakers with maintenance bypass switches, loop feed switches, line bus modifications, underground 26.4kV electrical feeders, concrete ductbank, primary transformers, voltage regulators, and fused load break switches.

An electronic transformer building (Building 347) is located within the area of potential development for the nuclear propulsion facilities near the conceptual footprint for the MSF (see Figure 2.4-2). As such, the utility function provided by the Building 347 transformers would need to be relocated or otherwise incorporated into the electrical specifications for the proposed construction of the nuclear propulsion maintenance facilities and the already planned electrical upgrades at nearby Wharf F.

Group 3 alternatives would require construction and operation of CVN nuclear propulsion plant maintenance facilities. The maximum electric requirement of these facilities would be 2,000 kVA (the expected demand would 7,000 MWh per year), which is less than the existing 7,500 kVA capacity at the shore facilities (DoN 1997). These electrical requirements could be met with the combination of the baseline NAVSTA Mayport infrastructure plus the planned electrical upgrades to Wharf F (McVann 2007b). Only the gain of approximately 1,200 net daily and associated on-Station dependent populations under Alternative 12 would place notable additional demand on the existing NAVSTA Mayport electrical infrastructure. JEA infrastructure would be upgraded to meet the increased demand. Therefore, with the planned upgrades to Wharf F, no significant impact to electricity would occur under the Group 3 alternatives.

Steam. The CVN requires steam at a constant rate of 7,000 lbs/hr and a maximum flow rate of 15,500 lb/hr. This demand for steam would be offset by the decommissioning of the KENNEDY and overall reduction in the number of ships by 2014 under all Group 3 alternatives. The nuclear propulsion plant facilities also would have a minor steam requirement of approximately 3,200 Million British Thermal Units per year (DoN 1995), which is within the capacity of the existing steam plants at NAVSTA Mayport. In addition, the planned utilities upgrades to Wharf F incorporate anticipated peak steam demand associated with the proposed CVN homeporting. Because of the steam distribution upgrades associated with new facilities and Wharf F, and the lack of a substantial demand from the CVN nuclear propulsion plant maintenance facilities on the available steam system capacity, there would be no significant impacts to the steam supply system from the Group 3 alternatives.

Compressed Air. The homeporting of a CVN would require 2,400 standard cubic feet per minute (scfm) compressed air at Wharf F. Under the Group 3 alternatives, utilities upgrades to Wharf F are planned to supply adequate compressed air flow. The upgrades incorporate the anticipated peak compressed air demand associated with the proposed CVN and compressed air demand from the CVN nuclear propulsion plant maintenance facilities of 280 mega standard cubic feet per year (DoN 1995). Therefore, with the proposed compressed air infrastructure upgrades to Wharf F, and the lack of any additional substantial demand on the compressed air capacity, the Group 3 alternatives would not have a significant impact on the compressed air supply system.

Fuel Supply. Analysis of the existing fuel distribution at Wharves C and F and the fuel supply specifications of the CVN indicates that existing infrastructure can accommodate the maintenance fuel requirements relative to DFM and JP-5. No new fuel supply connection modifications would be required for any of the Group 3 alternatives (McVann 2007b). The increased demand in JP-5 associated with CVN homeporting would be offset by the decommissioning of the KENNEDY. As with Group 1 and 2 alternatives, the on-site capacity would not be affected by any new combination of ships. Therefore, there would be no impact to the fuel supply system for any of the Group 3 alternatives.

4.11.3.2 Potable Water

Alternatives 10 and 12 of the Group 3 alternatives would result in personnel increases from 2006 baseline levels. Alternative 12 would the greatest increase of personnel at approximately 1,200. Based on a potable water demand of 50 GPD per person and 27,000 GPD demand for the nuclear propulsion maintenance (DoN 1995), the demand for potable water would be increased by approximately 87,000 GPD by the 2014 end state. When added to the average current water demand of 2.3 mg/d, the total demand of potable water for Alternative 12 would be less than 2.5 mg/d, which is only 25 percent of the 10 mg/d potable water system capacity. Additional demands on the potable water system would occur as a result of the dependent population. The improvements to Wharf F under the Group 3 alternatives include potable water infrastructure upgrades to meet the CVN homeporting requirements. The proposed CIF also would have the capability to generate the necessary pure water required by the CVN. Therefore, because of the Wharf F upgrades and the lack of any additional substantial demand for potable water, there would not be significant impacts to potable water under any of the Group 3 alternatives.

4.11.3.3 Sanitary Sewer

Analysis of the existing sewer collection system at Wharf F and discharge specifications of the CVN indicates that existing infrastructure would be capable of accommodating the maintenance sanitary sewer discharge requirements of the Group 3 alternatives. No new sanitary sewer collection sources or connection modifications are required at Wharf F (McVann 2007b).

As previously identified, only Alternative 12 of the Group 3 alternatives would result in additional demands on utilities systems due to gains in personnel (there would be an approximate 1,200 gain in net daily population with Alternative 12). Based on the generation rate of 50 GPD per person and 27,000 GPD generated by CVN nuclear propulsion plant maintenance personnel (DoN 1995), the volume of sanitary wastewater generated would be increased by approximately 87,000 GPD by the 2014 end state. This would increase the average daily loading from an estimated 0.9 mg/d to 1.0 mg/d, which is only half the daily treatment capacity of the existing DWTP. Additional demand on the sanitary sewer system would result from the increased dependent population. Therefore, because of the lack of any substantial increase in the volume of sanitary wastewater generated, there would be no significant impacts to the sanitary sewer system under the Group 3 alternatives.

4.11.3.4 Wastewater (Industrial and Oily)

Analysis of the existing wastewater collection system at Wharf F and the discharge specifications of the CVN indicates that existing infrastructure can accommodate the maintenance wastewater discharge requirements of the Group 3 alternatives. No new treatment sources or connection modifications would be required at Wharf F (McVann 2007b).

Of the Group 3 alternatives, the combination of ships in Alternative 12 would generate the highest average volume of wastewater, at 87,300 GPD. The proposed CVN nuclear propulsion plant maintenance facilities also would generate an estimated 89 GPD (DoN 1995), bringing the total wastewater load to 87,389 GPD. This is a decrease of 18,111 GPD below the 105,500 GPD of wastewater generated from the existing combination of berthed ships. The OWTP collection and treatment facilities have a design capacity of 0.288 mg/d. Because the existing infrastructure can accommodate the wastewater discharge requirements of the additional ships and since there would be a decreased loading to the OWTP, the Group 3 alternatives would result in no significant impact to industrial and oily wastewater.

4.11.3.5 Stormwater

Facilities required for CVN homeporting would be developed south of Wharf F and east of Wharf E. This area is identified in the SWPPP as Basin J (including outfalls 2 and 42) located west of Brice Cameron Street, northwest of the SERMC building and comprises 15.92 acres. The ponds were designed to be dry retention, but the raised groundwater does not allow the stormwater to percolate within 72 hours of a rain event. A second potential development area is located along the northern edge of the turning basin, Basin AT, and is comprised of 7.14 acres, as identified in the SWPPP. Stormwater runoff within this basin sheet flows toward the northern portion of the turning basin where there is no apparent concentrated outfall.

Construction and operation of the nuclear propulsion plant and associated facilities would require the upgrade to existing stormwater infrastructure in Basin J and AT. Impervious surface is not expected to change dramatically since the area is currently largely paved parking. However, in order to comply with regulations on TMDLs issued in December 2007, the new impervious discharges that would result from the Group 3 alternatives would be evaluated and mitigation implemented to prevent additional nutrients from reaching receiving waters. In addition, a Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems would be required in association with the new construction and stormwater infrastructure. With the new industrial activity at the nuclear propulsion plant maintenance facilities, the NAVSTA Mayport SWPPP would need to be modified. The MS4 maintenance plans and goals may need to be modified to address new impervious surface activities. Because TMDLs would be connected to the MS4 permit, any modifications to the plans and goals affecting how allocations would be accomplished may need to be submitted to FDEP for review and approval (Dombrosky 2007).

The proposed traffic improvements along Massey Avenue would affect seven different drainage basins: Basins C, P, O, N, M, F, and B. Topography is flat and drainage is to various directions within these basins, which is why there is a high number of them. However, along Massey Avenue drainage is controlled via drainage ditches that are on the north and south shoulders of the existing roadway and are on the eastern and western shoulders of Baltimore Street. Drainage basins along Moale Avenue are on the northern shoulder and drain centrally southward to Lake Wonderwood, all of which are part of Basin C. Additional impervious surface would be created by the road widening and intersection improvement projects. The improvements would affect an estimated 12 acres and, therefore, would require issuance of a Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems. In addition, modification of MS4 plans and goals may be required. The design of the improvements would need to evaluate stormwater runoff from new impervious surfaces and mitigate to prevent additional nutrients from entering receiving waters. Because TMDLs are connected to the MS4 permit, any modifications to the plans and goals affecting how allocations would be accomplished may need to be submitted to FDEP for review and approval (Dombrosky 2007).

Alternatives 8 and 12 also would include the construction of the DESRON headquarters building and would result in the same localized impacts to stormwater as described in Section 4.11.1.5.

Overall, the impacts of new construction under the Group 3 alternatives would have localized impacts to stormwater infrastructure. However, design would be incorporated into construction to either treat and remove nutrients in stormwater before entering receiving waterways (i.e., the St. Johns River) or prevent stormwater from reaching receiving waterways and to meet applicable stormwater management permit requirements. As with the Group 1 and 2 alternatives, guidelines for integrating LID stormwater strategy into planning and design of facilities would occur in accordance with the Navy's LID policy and UFC 3-210-10, *Low Impact Development* (DoD 2004). Therefore, there would be no significant impacts to the stormwater system.

4.11.3.6 Solid Waste

The collection process of solid waste for disposal at the wharves is the same for all ships, utilizing the existing dumpsters already in place at the wharves. No new solid waste dumpsters would be required for any of the Group 3 alternatives (McVann 2007b). As previously identified, Alternative 12 of the Group 3 alternatives has the greatest increase of personnel at approximately 1,200, decreasing the number of nondeploying net daily personnel by 420, and increasing the number of net daily ships personnel in port by 1,589. Based on an estimated generation rate of 8.7 lbs/day for nondeploying person and 3.7 lbs/day for ships personnel, the solid waste volume generated would be increased by approximately 2,200 lbs/day (1.0 tons/day) by the 2014 end state. This additional 1.0 tons would be a negligible increase to the estimated average daily loading of 1,850 tons per day received by the Trail Ridge Landfill. The increase in the dependent population also would contribute to the solid waste generation and disposal requirements. The collection and disposal of solid waste from the Group 3 alternatives would not impact the operational performance or life expectancy of the Trail Ridge Landfill. The remaining alternatives in Group 3 all would result in solid waste increases of a lesser magnitude than Alternative 12 (and, under Alternatives 4 and 8 there would be a decrease in solid waste generation). Therefore, with no substantial increase in demand on the existing solid waste disposal capacity, there would be no significant impacts to solid waste from implementation of the Group 3 alternatives.

4.11.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, NAVSTA Mayport would continue to use and generate the same types of demand for utilities as described in Chapter 3. The No Action Alternative would not result in any upgrades performed on existing utility infrastructure. There would be decreased demand for all utilities as the number of ships homeported would drop to from 22 to 11 by the 2014 end state and the net daily population would decrease by approximately 3,900 from baseline 2006 levels. This decreased demand would not result in significant impacts to any of the utilities systems.

4.11.5 Mitigation Measures

None of the utilities would be significantly impacted by any of the Group 1, 2, or 3 alternatives. Therefore, no mitigation measures are proposed to minimize significance.

4.12 ENVIRONMENTAL HEALTH AND SAFETY

The nature and magnitude of potential impacts associated with hazardous and toxic materials and wastes depends on the toxicity, storage, use, transportation, and disposal of these substances. Factors considered in the impacts assessment were changes in the storage, use, handling, or disposal of hazardous materials, toxic substances, and hazardous and associated risk to human health due to direct exposure; risk of environmental contamination; and applicable federal, state, DoD, and local regulations.

Factors considered in the impact analysis for public safety are increased risk of incidents or potential violation of applicable OSHA and NAVOSH regulations.

4.12.1 Group 1 Alternatives (Alternatives 1, 2, 5, and 6)

4.12.1.1 Installation Restoration Program

The existing IRP sites at NAVSTA Mayport would not be altered or affected by implementation of Group 1 alternatives. Similarly, contaminants identified in soil and groundwater at the existing IRP sites would not impact the development of the DESRON headquarters under Alternatives 1 and 6 or the PHIBRON headquarters under Alternative 5.

4.12.1.2 Hazardous/Toxic Materials and Waste Disposal

Construction of the DESRON headquarters under Alternatives 1 or 6 or the PHIBRON headquarters under Alternative 5 would temporarily increase hazardous/toxic materials use and waste disposal. Long-term demands on fuels for heating, hot water production, and backup power supply would be mitigated through the implementation of sustainability strategies (e.g., implementation of LEED principles) for new construction. Quantities of ACM, LBP, and PCBs present at NAVSTA Mayport would remain unchanged under Group 1 alternatives, because ACM, LBP, or PCBs would not be encountered in construction of the new DESERON headquarters or PHIBRON headquarters buildings and the potential quantities of these materials in ships to be homeported under these alternatives would not differ from those of existing homeported ships. It is expected that the types and quantities of hazardous waste generated at NAVSTA Mayport would not change significantly as a result of Group 1 alternatives. The existing NAVSTA Mayport facilities and established procedures for managing hazardous waste would not need to be altered to accommodate the types and quantities of hazardous waste that would be generated under Group 1 alternatives. As compared to the 2006 baseline, there would be fewer ships homeported at NAVSTA Mayport under any Group 1 alternative and, therefore, wastes generated from homeported ships would be expected to be reduced.

Due to the above factors and existing programs for management of hazardous/toxic materials and hazardous waste at NAVSTA Mayport, implementation of any Group 1 Alternative would not be expected to have a significant adverse impact in terms of hazardous/toxic materials and waste disposal.

4.12.1.3 Safety

Aside from the construction of the DESRON headquarters under Alternatives 1 and 6 or the PHIBRON headquarters under Alternative 5, Group 1 alternatives would not introduce new risks to safety. Because fewer ships would be homeported under each Group 1 alternative and the net daily population would be decreased as compared to the 2006 baseline, there would be corresponding reduction of safety incidents. In implementing Group 1 alternatives, the Navy would adhere to the principles of Operational Risk Management (e.g., as set forth in OPNAVINST 3500.39b) in assessing safety hazards and implementing preventive and risk reduction strategies. Contractors performing work would be contractually required to adhere to OSHA regulations, standards, and guidelines including site-specific Health and Safety Plans that would be reviewed and approved by the Navy prior to initiation of onsite activities. Therefore, Group 1 alternatives would not result in significant impacts to safety.

4.12.1.4 Environmental Justice/Protection of Children

Although two census tracts in the ROI with greater minority populations and one census tract in the ROI with a greater low-income population than the comparison area were identified (see Section 3.12.5), implementation of Group 1 alternatives would not result in disproportionately high and adverse human health or environmental effects on minority and/or low-income. Similarly, implementation of any Group 1 alternative would not result in environmental health or safety risks that may disproportionately affect children. Therefore, no significant impacts to environmental justice or protection of children would occur under any Group 1 alternative.

4.12.2 Group 2 Alternatives (Alternatives 3, 7, 9, and 11)

4.12.2.1 Installation Restoration Program

The existing IRP sites at NAVSTA Mayport would not be altered or affected by implementation of any Group 2 alternative. Similarly, the contaminants identified in soil and groundwater at the existing IRP sites do not occur at the areas to be disturbed for construction of the DESRON headquarters under Alternatives 7 and 11.

4.12.2.2 Hazardous/Toxic Materials and Waste Disposal

As with Group 1 alternatives, the number of ships homeported and net daily population under Group 2 alternatives would be less than the 2006 baseline. Therefore, hazardous/toxic materials use and waste disposal requirements would be expected to be decreased under all Group 2 alternatives. As with Group 1 Alternatives 1 and 6, short-term increases would occur due to the construction of the DESRON headquarters under Alternatives 7 and 11. As with Group 1 alternatives, ACM, LBP, and PCBs present at NAVSTA Mayport would remain unchanged under Group 2 alternatives. However, the quantity of fuels delivered to and used would increase during the dredging activities proposed under Group 2 alternatives. Requirements for fuel acquisition, temporary storage, and consumption would increase during these activities due to the need to power dredges, tugboats, crew boats, and other dredging equipment. Additional fuels would be required to power mobile power generators and small equipment and vehicles used by contractors and inspection and oversight personnel.

The risk of uncontrolled release of hazardous substances would be minimized through the use of industry accepted methods of storage for fuels (e.g., double-walled aboveground storage tanks equipped with leak detection systems) and other hazardous materials (e.g., self-contained storage cabinets with appropriate flammability ratings). The contractors conducting dredging and related operations (e.g., transportation and disposal of dredge materials) would be required to operate in compliance with applicable U.S. Coast Guard, federal, and state (if applicable) regulations. In addition, while operating in the NAVSTA Mayport turning basin and entrance channel, contractors would be required to operate under the requirements specified in relevant environmental management documents developed by NAVSTA Mayport, including, but not limited to, the SPCC Plan, SWPPP, Hazardous Waste Management Plan, Emergency Response Action Plan (ERAP), Facility Response Plan, and Activity-Specific Emergency Action Plans as such plans are developed.

Potential spills from the secondary containment structures associated with ASTs or spills in uncontained areas would be controlled through the use of sorbent materials, portable booms, or other barriers. Absorbent materials such as dry sweep, sawdust, clay, vermiculite, diatomaceous earth, and manufactured oil absorbents would be used to control small isolated spills. Absorbent materials and spill kits are currently maintained in sufficient quantities at existing oil handling and storage facilities and would be provided at any new oil handling and storage facilities constructed or operated under Group 2 alternatives.

It is expected that the types and quantities of hazardous waste generated would not change significantly as a result of implementation of any Group 2 alternatives. The existing facilities and established procedures for managing hazardous waste would not need to be altered to accommodate the types and quantities of hazardous waste generated. The potential exception to this would be if portions of dredged material do not meet MPRSA Section 103 rules for ocean disposal and require placement at an upland disposal site and such material displays hazardous waste characteristics. Material would be disposed of at existing, approved sites that have established safeguards for hazardous and toxic materials in accordance with FDEP permit requirements. Due to the above factors and existing programs for management of hazardous/toxic materials and hazardous waste at NAVSTA Mayport, implementation of any Group 2 alternative would not have a significant adverse impact on at NAVSTA Mayport.

4.12.2.3 Safety

The practice of integrating safety into the earliest phases of acquisition (concept and design) would be applied to the projects proposed under Group 2 alternatives by designing engineered hazard controls into new acquisitions in an effort to reduce mishaps. For example, Health and Safety Plans that include Activity Hazard Analysis and Accident Prevention sections would be developed for dredging and construction projects, and these plans will be reviewed and approved by the Navy Safety and Occupational Health prior to initiation of onsite activities.

The dredging operations would require pre-planning to assess potential hazards, and these hazards would be described in health and safety documents (e.g., Health and Safety Plan, Accident Prevention Plan) on a per project basis. [This includes reviewing the data from 2007 remote sensing survey of the dredge prism to identify any potential unexploded ordnance given that the channel is within a danger area for such as posted on the nautical chart.] All dredging-related activities, including transportation and disposal of dredge materials, would be conducted in accordance with applicable federal, state, local, and DoD regulations, including but not limited to U.S. Coast Guard regulations and U.S. Navy standard navigation and afloat safety procedures.

Dredged material likely would be disposed of in an USEPA-managed ODMDS; however, the placement of material at an upland disposal site would be necessary for any volume of material that does not meet MPRSA Section 103 rules for ocean disposal. If this were to occur, only existing, approved upland sites would be used in accordance with existing safety plans and procedures.

During construction and dredging, only authorized personnel would be allowed within the footprint of designated construction and dredging areas. Procedures would be developed and implemented to ensure that the entrance channel floating barricade is closed whenever possible during dredging operations. Such procedures would assist NAVSTA Mayport in maintaining compliance with AT/FP requirements and in protecting the public safety by minimizing the risk of collection with and preventing access to NAVSTA Mayport by unauthorized commercial and recreational vessels. In addition, all workers would adhere to safety standards established by NAVSTA Mayport, as well as OSHA and NAVOSH requirements. Therefore, Group 2 alternatives would not have a significant adverse impact on environmental health and safety at NAVSTA Mayport.

4.12.2.4 Environmental Justice/Protection of Children

As with Group 1 alternatives, although two census tracts in the ROI with greater minority populations and one census tract in the ROI with a greater low-income population than the comparison area were identified (see Section 3.12.5), implementation of Group 2 alternatives would not result in disproportionately high and adverse human health or environmental effects on minority and/or low-income populations. Similarly, implementation of any Group 2 alternative would not result in environmental health or safety risks that may disproportionately affect children. Therefore, no significant impacts to environmental justice or protection of children would occur under any Group 2 alternative.

4.12.3 Group 3 Alternatives (Alternatives 4, 8, 10, and 12)

4.12.3.1 Installation Restoration Program

Seven SWMUs: 01, 23, 24, 25, 44, 45, and 46, are located near the proposed CVN nuclear propulsion plant maintenance facilities (see Figure 3.12-1). The contaminated sites located near the area of proposed development have been investigated, and several have been subject to soil removal actions. In addition, the groundwater at several of the SWMUs is subject to periodic monitoring as a part of LUCs for these sites and site inspections would be used to ensure that the LUCs are being maintained. Additionally, the ongoing groundwater monitoring would give indication of whether known contaminants are moving off site and would be likely to impact the area of proposed development. Therefore, it is expected that the organic (e.g., petroleum, PAHs) and inorganic (e.g., metals) contaminants identified in surface soils, subsurface soils, and groundwater at these sites would not have a significant adverse impact on the environmental condition of the property where construction would occur under Group 3 alternatives.

Four SWMUs: 17, 46, 20 and 21, are located near the proposed widening of Massey Road (see Figure 3.12-1). The contaminated sites located near the area of proposed development have been investigated. SWMU 17 is the only site that requires ongoing management action, to include the implementation of LUCs that would prevent residential development and restrict disturbance of soils at the SWMU 17. Site inspections would be used to ensure that the LUCs are being maintained. Therefore, there would be no significant impact on the environmental condition of the property where construction would occur under Group 3 alternatives.

4.12.3.2 Hazardous/Toxic Materials and Waste Disposal

The hazardous/toxic materials and waste disposal impacts would be similar to those described for Group 2 alternatives. However, under Group 3 alternatives there would be additional hazardous/toxic materials used and waste generated as a result of the construction of the CVN nuclear propulsion plant maintenance facilities, Massey Road widening, intersection improvements, and construction of parking structures at existing surface parking lots. The demolition of Building 347, a ships' cable storage facility would be required at the site of the CVN nuclear propulsion plant maintenance facilities. Given that this 700 sf facility was constructed in 1965 and includes a transformer, PCBs, ACM, and LBP could be encountered. If encountered, such materials would be handled in accordance with all applicable federal, state, DoD, and DoN requirements. The Massey Road widening, intersection improvements, and parking structure construction projects would involve the use of hazardous/toxic materials and would generate waste that could have hazardous or toxic properties (e.g., used asphalt). As with Alternatives 1, 6, 7, and 11, Group 3 Alternatives 8 and 12 would include the construction of a DESRON headquarters that also would temporarily increase hazardous/toxic materials use and waste disposal.

The proposed CVN nuclear propulsion plant maintenance facilities would include a hazardous waste accumulation area and space for storage of liquid waste containers and mixed waste. Section 5.4.3.3 addresses management of these materials. The RCRA/HSWA permitted hazardous waste storage facility currently operates well below its permitted storage capacity; therefore, it is expected that it could feasibly accommodate storage of the hazardous and mixed waste generated during and after the proposed construction projects.

Over the long term, quantities of various petroleum fuels in excess of current operating demand would be required to meet future operating demand due to the increase in the number of buildings and (with the exception of Alternatives 4 and 8) increased net daily population at NAVSTA Mayport using fuels for heating, hot water production, and backup power supply. In newly constructed buildings, this increased demand for petroleum fuels would be mitigated through the implementation sustainability strategies (e.g., implementation of LEED principles) under Group 3 alternatives.

4.12.3.3 Safety

The potential impacts to safety under Group 3 alternatives would be similar to those described for Group 2 alternatives. The additional construction associated with the CVN propulsion maintenance facilities, transportation improvements, and parking structures under Group 3 alternatives (plus the DESRON headquarters under Alternatives 8 and 12) would result in temporary increased risk of construction-related mishaps that would be mitigated through adherence to safety standards established by OSHA, NAVOSH, and NAVSTA Mayport. Over the long term, the transportation improvement projects would increase vehicular and pedestrian safety along Massey Avenue and at the five intersections that would be improved. Safety impacts related to radiological hazards are addressed in Chapter 5.

4.12.3.4 Environmental Justice/Protection of Children

As with Group 1 and 2 alternatives, although two census tracts in the ROI with greater minority populations and one census tract in the ROI with a greater low-income population than the comparison area were identified (see Section 3.12.5), implementation of Group 3 alternatives would not result in disproportionately high and adverse human health or environmental effects on minority and/or low-income populations. Similarly, implementation of any Group 3 alternative would not result in environmental health or safety risks that may disproportionately affect children. Therefore, no significant impacts to environmental justice or protection of children would occur under any Group 3 alternative.

4.12.4 No Action Alternative (Alternative 13)

Under the No Action Alternative, there would be no construction associated with new facilities or dredging and the number of ships homeported and the net daily population at NAVSTA Mayport would be reduced. As with many of the action alternatives, the amount of hazardous/toxic materials and waste disposal would be expected to decrease with commensurate with the decrease in number of ships homeported and NAVSTA Mayport population. Otherwise, there would be no impacts in terms of the IRP, safety, and/or environmental justice/protection of children.

4.12.5 Mitigation Measures

No significant adverse impacts to environmental health and safety are expected to result from implementation of the action alternatives based on the presence of contamination (e.g., SWMUs, IRP sites), use and storage of hazardous/toxic materials, generation of hazardous waste, or introduction of unacceptable risk to health or safety; therefore, no mitigation would be required in reference to environmental health and safety impacts.

CHAPTER 5
RADIOLOGICAL ASPECTS OF NUCLEAR - POWERED AIRCRAFT CARRIER HOMEPORTING

This section evaluates the radiological aspects of homeporting a CVN and related shore-based support facilities, and provides relevant information on the Naval Nuclear Propulsion Program (NNPP), which, pursuant to federal law, regulates radioactivity associated with Naval nuclear propulsion work. The policies of the NNPP are applied consistently to all locations where nuclear-powered ships are berthed or maintained.

This section has been developed making full use of the extensive body of unclassified environmental information available on nuclear propulsion matters. This information includes detailed annual reports published over three decades; independent environmental surveys performed by USEPA, by states in which NNPP facilities are located, and by some foreign countries; and a thorough independent review performed by the U.S. Government Accountability Office in 1991 (GAO 1991). The analyses summarized in this chapter are fully discussed in Appendix H, including input data and methodology, to facilitate independent verification of results.

Because nuclear propulsion technology is among the most sensitive military technologies possessed by the United States, Congress has placed stringent limitations on foreign access under the Atomic Energy Act of 1954 (amended) and other federal statutes. Appendix I, which is classified, contains Naval reactor design information and analysis of postulated accidents. The analysis of Appendix I supports the discussion of potential impacts presented in the unclassified portion of the EIS. However, all potential environmental impacts or conclusions discussed in Appendix I are covered in the unclassified sections of this EIS.

Chapter 9 of this EIS provides a list of abbreviations and acronyms and Appendix K provides a glossary of terms. Information on radiation exposure and risks associated with radiation exposure is contained in Appendix G. Appendix G provides information on radiation in general and includes discussions on background radiation and the risks as compared to some of the everyday hazards of life.

5.1 THE NNPP

5.1.1 History and Mission of the Program

In 1946, at the conclusion of World War II, Congress passed the Atomic Energy Act, which established the Atomic Energy Commission (AEC) to succeed the wartime Manhattan Project. In the Atomic Energy

Act, Congress gave the AEC sole responsibility for developing atomic energy. At that time, then captain (later Admiral) Hyman G. Rickover was assigned to the Navy Bureau of ships, the organization responsible for Naval ship design. Rickover recognized the military implications of successfully harnessing atomic power for submarine propulsion, and that it would be necessary for the Navy to work with the AEC to develop such a program. By 1949, Rickover had forged an arrangement between the AEC and the Navy that led to the formation of the NNPP.

In 1955, the nuclear submarine USS NAUTILUS put to sea and demonstrated the basis for all subsequent U.S. nuclear-powered warship designs. In the 1970s, government restructuring moved the NNPP from the AEC (which was disestablished) to what ultimately became the Department of Energy (DOE). As the NNPP grew in size over the years, it retained its dual responsibilities within the DOE and the Department of the Navy, and its basic organization, responsibilities and technical discipline have remained as they were when first established.

Today, the NNPP continues as a joint Navy/DOE organization responsible for all matters pertaining to Naval nuclear propulsion pursuant to Presidential Executive Order 12344, permanently enacted as Public Law 98-525 (42 U.S.C. 7158). As of July 2007, the NNPP is responsible for the following:

- The nuclear propulsion plants in 81 U.S. nuclear-powered ships.
- Two moored training ships located in Charleston, South Carolina used for Naval nuclear propulsion plant operator training.
- Nuclear work performed at six shipyards (four public and two private).
- Two DOE-owned, contractor-operated laboratories devoted solely to Naval nuclear propulsion research, development, and design work.
- Two land-based prototype Naval nuclear reactors used for research and development and for training Naval nuclear propulsion plant operators.

The NNPP’s conservative design practices and stringent operating procedures have resulted in the demonstrated safety record of Naval nuclear propulsion plants. As of July 2007, U.S. Naval reactors have accumulated over 5900 reactor-years of operation and have steamed over 137 million miles and there has never been a reactor accident, nor any release of radioactivity that has had an adverse effect on human health or the quality of the environment. The following sections provide a detailed discussion of the

NNPP. For further information on this subject, see DOE/DOD 2006, Duncan 1990, and Hewlett and Duncan 1974.

5.1.2 Nuclear Propulsion for Navy Ships

The source of energy for powering a Naval nuclear ship originates from fissioning uranium atoms within the reactor core. Pressurized water circulating through a closed primary piping system transfers heat from the reactor core to a secondary steam system isolated from the reactor cooling water. The heat energy is then converted to mechanical energy to propel the ship, and provides electrical power to the rest of the ship.

Nuclear propulsion significantly enhances the military capability of aircraft carriers. Nuclear propulsion provides virtually unlimited high-speed endurance without dependence on tankers and their escorts. Moreover, the space normally required for propulsion fuel in oil-fired ships can be used for aircraft fuel in nuclear-powered ships. Because of these enhanced military capabilities, the older conventionally powered aircraft carriers (CVs) are being replaced by modern nuclear-powered aircraft carriers (CVNs).

5.1.3 Philosophy of the NNPP

Naval nuclear propulsion plants must be military capable and reliable in combat, as well as safe for the environment, the public, and those who operate and service them. The NNPP’s success is based on strong central technical leadership, thorough training, conservatism in design and operating practices, and an understanding that in every aspect of the Program, excellence must be the norm. In addition, there is recognition that individuals must accept responsibility for their actions to maintain these standards. Admiral Rickover said it this way, “Responsibility is a unique concept: it can only reside and inhere in a single individual. You may share it with others, but your portion is not diminished. You may delegate it, but it is still with you. You may disclaim it, but you cannot divest yourself of it. Even if you do not recognize it or admit its presence, you cannot escape it. If responsibility is rightfully yours, no evasion, or ignorance or passing the blame can shift the burden to someone else. Unless you can point your finger at the person who is responsible when something goes wrong, then you have never had anyone really responsible.”

Since radioactive material is an inherent by-product of the nuclear fission process, its control has been a central concern for the Navy’s nuclear propulsion program since its inception. Radiation levels and releases of radioactivity have historically been controlled well below those permitted by national and international standards. All features of design, construction, operation, maintenance, and personnel selection, training, and qualification have been oriented toward minimizing environmental effects and ensuring the health and safety of workers, ships' crew members, and the public. Conservative reactor safety design has, from the beginning, been a hallmark of the NNPP.

5.1.4 Safety Record of the NNPP

The history of safe operation of the Navy's nuclear-powered ships and their support facilities is a matter of public record. This record shows a long and extensive history of the NNPP's activities having no adverse effect on the environment. Detailed environmental monitoring results published yearly provide a comprehensive description of environmental performance for all NNPP facilities. Report NT-07-1 (NNPP 2007a) discusses the performance for all the ships, bases, and shipyards. This record confirms that the procedures used by the Navy to control radioactivity from U.S. Naval nuclear-powered ships and their support facilities are effective in protecting the environment and the health and safety of Sailors, workers and the general public.

NNPP reactor designs have received independent evaluations from the Nuclear Regulatory Commission (NRC) and the Advisory Commission on Reactor Safeguards (ACRS). These reviews were conducted as a means to provide confirmation and added assurance that nuclear propulsion plant design, operation, and maintenance pose no undue risk to public health and safety.

In addition, in 1991 the GAO completed a thorough 14-month review of DOE sites under the cognizance of the NNPP (GAO 1991). This review included full access to classified documents. The GAO investigators also made visits to the DOE laboratory and prototype sites supporting the NNPP, which operate to the same stringent standards imposed on Naval facilities and activities; and spent time on a nuclear-powered warship. The GAO review concentrated on environmental, health, and safety matters, including reactor safety. In congressional testimony on April 25 1991, the GAO stated in part:

In the past, we have testified many times before this committee regarding problems in the Department of Energy (DOE). It is a pleasure to be here today to discuss a positive program in DOE. In summary, Mr. Chairman, we have reviewed the environmental, health, and safety practices at the Naval Reactors laboratories and sites and have found no significant deficiencies.

The USEPA has conducted independent environmental monitoring in U.S. harbors during the past several decades. The results of these extensive, detailed surveys have been consistent with Navy results. These surveys have confirmed that U.S. Naval nuclear-powered ships and support facilities have had no significant effect on the environment (USEPA 1998b, USEPA 1999d, USEPA 2001a, USEPA 2001b, USEPA 2003b, USEPA 2004, USEPA 2005a, USEPA 2005b).

The safety record of U.S. Naval nuclear propulsion plants aboard nuclear-powered warships is well known; there has never been a reactor accident in over 50 years since the first Naval reactor began operation, a record comprising over 5,900 reactor-years of experience. The NNPP currently operates 81 nuclear-powered warships (as of June 2007), one research vessel, two moored training ships, and two land-based prototypes powered by 102 Naval nuclear reactors. Since 1955, U.S. Naval nuclear-powered warships have steamed over 137 million miles. These ships have visited more than 150 ports in over 50 foreign countries and dependencies. There has never been any release of radioactivity that has had an adverse effect on the public or the environment.

U.S. nuclear-powered warships and their reactors are designed to exacting and rigorous standards. They are designed to survive wartime attack, include redundant systems and auxiliary means of propulsion, and are operated by highly trained crews using rigorously applied procedures. All of these features enhance reactor safety just as they contribute to the ability of the ship to survive attack in time of war.

Critical to safety are the officers and Sailors who operate the Naval nuclear propulsion plants aboard nuclear-powered warships. Since the 1950s, over 115,000 officers and enlisted technicians have been trained in the NNPP. The officer selection process accepts only applicants who have high standing at colleges and universities. All personnel receive 1 to 2 years of training in theoretical knowledge and practical experience on operating reactors that are like the reactors used on ships. Even after completing this training, before manning a nuclear propulsion plant watch station, the personnel must requalify on the ship to which they are assigned. In addition to the extensive training and qualification program, multiple layers of supervision and inspection are employed to ensure a high state of readiness and compliance with safety standards. When a ship's reactor is in operation at sea, there are both enlisted technicians and officers on duty, with an average total of 40 years of experience in Naval nuclear propulsion.

All U.S. Naval nuclear-powered warships use pressurized water reactors. The radioactive fission products are contained within high-integrity fuel elements that are designed to meet battle shock well in excess of 50 times the force of gravity. The fuel is designed to preclude release of fission products to the primary coolant. Only limited radioactivity is found in the pure water used in the all-welded primary coolant system. The principal sources of radioactivity in the pure water are trace amounts of corrosion and wear products from reactor plant metal surfaces in contact with this reactor water. The reactor compartment forms a container and shields the crew from radiation. This compartment is radiologically clean so that it can be entered without any protective clothing within minutes of shutting down the reactor.

Substantial data exist verifying the high integrity of U.S. Naval reactor designs. Two nuclear-powered submarines (USS THRESHER and USS SCORPION) sank during operations at sea in the 1960s. Neither was lost due to a reactor accident, but both losses resulted in the ship exceeding crush depth and the hull being crushed inward by tremendous sea pressure. Radiological surveys of the debris sites have been performed on several occasions over the past three decades and confirm that, despite the catastrophic manner in which these ships were lost, no detectable radioactive fission products have been released into the environment. The only radioactivity found at these sites was from corrosion products from the primary coolant system. The amount of radioactivity found in the surveys was less than the naturally occurring radioactivity in the seabed sediment. These data are reported in detail and are available to the public (KAPL 2000).

In addition to the many safety considerations referred to above, several other factors enhance Naval reactor safety. Naval reactors are smaller and lower in power rating than typical commercial plants. Because naval reactors must fit aboard a warship, they are smaller and have a much lower power rating than commercial reactors. Also, since reactor power is directly linked to propulsion requirements, naval reactors typically operate at low power when the warship is in port, naval reactors are normally operated at very low power or shut down entirely. Their smaller size and the fact that they normally operate at low power or are shut down when in port mean that, in the highly unlikely event of a problem with the reactor, less than one percent (<1%) of the radioactivity contained in a typical commercial power reactor could be released from a naval reactor plant. The plant is designed to withstand a wide variety of casualty conditions without damage to the reactor core or release of significant amounts of radioactivity. Naval reactors are mobile and move through a source of unlimited seawater that can be used for emergency cooling and shielding if ever needed. In the event of a nuclear reactor accident, the ship can be rigged and towed away from populated areas, which, of course, is not the case for a fixed, land-based reactor. There are numerous ways to move a CVN including the use of its other reactor plant and the use of tugs or other tow craft. Sufficient time exists to support safe movement in the highly unlikely event of such an occurrence. Notwithstanding the remote possibility of occurrence, the potential range of postulated nuclear accidents has been analyzed and is discussed in Appendix I (classified).

Consistent with past practice, the CVN nuclear propulsion plant design was independently reviewed by the NRC (the Directorate of Licensing Division of the Atomic Energy Commission at the time) and the ACRS. These reviews concluded that CVN reactors can be safely operated.

5.2 NAVAL NUCLEAR-POWERED SHIPS

In Naval nuclear propulsion plants, fissioning of uranium atoms in the reactor core produces heat. Since the fission process also produces radiation, shielding is placed around the reactor to protect the crew. U.S. Naval nuclear propulsion plants, including CVNs, use a pressurized water reactor design that has two basic systems: the primary system and the secondary system. The arrangement is shown in Figure 5.2-1. The primary system circulates ordinary demineralized water in an all-welded, closed-loop system consisting of the reactor vessel, piping, pumps, and steam generators.

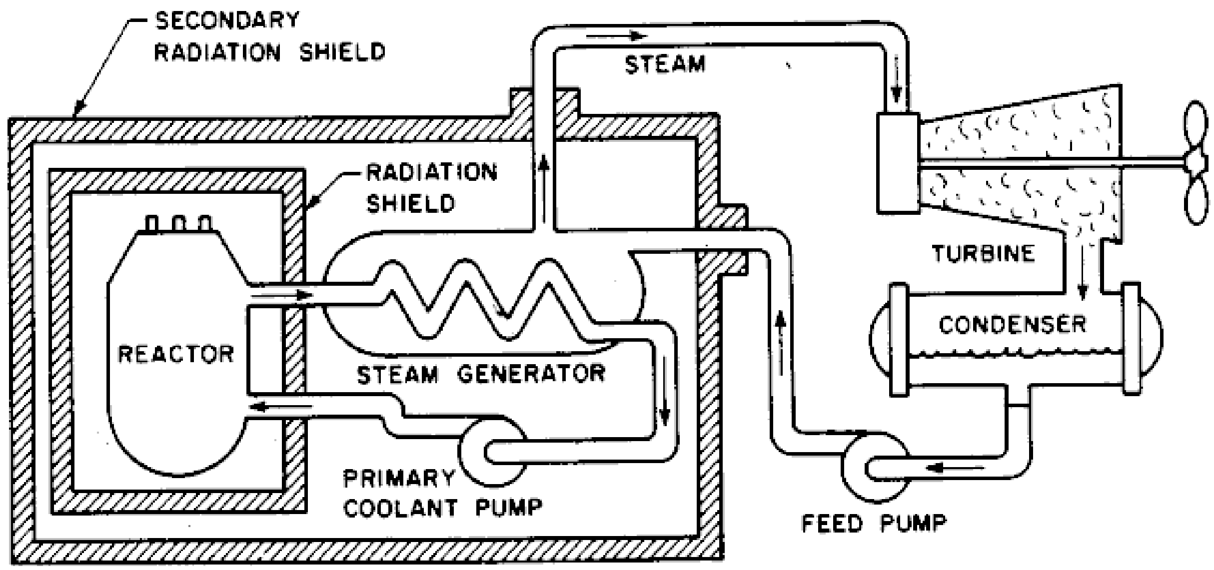

Figure 5.2-1 Pressurized Water Reactor

The heat produced in the reactor core is transferred to the water, which is kept under pressure to prevent boiling. The heated water passes through the steam generators where it transfers its energy. The primary water is then pumped back to the reactor to be heated again.

Inside the steam generators, the heat from the primary system is transferred across a watertight boundary to the water in the secondary system, also a closed loop. The secondary water, which is at a relatively low pressure, boils, creating steam. Isolation of the secondary system from the primary system prevents water in the two systems from intermixing, keeping radioactivity out of the secondary water.

In the secondary system, steam flows from the steam generators to drive the main propulsion turbines, which turn the ship's propellers, and the turbine generators, which supply the ship with electricity. After passing through the turbines, the steam is condensed back into water and feed pumps return it to the steam generators for reuse. Thus, the primary and secondary systems are separate, closed systems in which constantly circulating water transforms energy produced in the nuclear chain reaction into useful work.

The reactor core is installed in a heavy-walled pressure vessel within a primary shield. This shield limits exposure from gamma and neutron radiation produced when the reactor is operating. Reactor plant piping systems are installed primarily inside a reactor compartment, which is surrounded by a secondary shield. Because of these two shields, the resulting radiation outside the propulsion plant spaces during reactor plant operation is generally not any greater than background radiation (NNPP 2007b).

5.2.1 Reactor Design and Operation

The design and operation of Naval nuclear-powered ships result in minimal risk of accidents, particularly while in port, and the consequences would be small should a problem occur. There are a number of reasons why this is so. A Naval reactor aboard a CVN is rated at only a fraction of the power of a commercial nuclear power plant. When a nuclear-powered aircraft carrier is moored in port, its reactor is normally shut down or operating at very low power levels since no power is required for propulsion. Since the plants are designed to accommodate significant transients to respond to the variable demands of warship propulsion while at sea, in-port operation is far less demanding on the plant. The plants must also meet stringent military requirements for shock and battle conditions, and are installed within strong hulls that also must meet stringent military requirements. The operators of Naval nuclear reactors are carefully selected, qualified to exacting standards, and trained to explicit procedures. Finally, the mobility of a ship provides for the removal of the problem source in the unlikely event of an accident.

The nuclear fuel in Naval nuclear propulsion reactor cores uses highly corrosion-resistant and highly radiation-resistant materials. The resistance to corrosion on the protective cladding of the fuel elements is so high that the corrosion rate is negligible. The reactor could remain submerged in seawater for centuries without releasing fission products while the radioactivity decays. As a result, the fuel is very strong and has very high integrity. The fuel is designed, built, and tested to ensure that the fuel construction will contain the radioactive fission products both during normal reactor operations and in more severe conditions such as extreme battle shock. Typical commercial nuclear power plants differ from Naval nuclear propulsion plants in fuel design. Civilian fuel is designed to meet the requirements of peacetime power production ashore. NRC regulations allow some release of fission products within regulatory limits under normal operations.

Naval nuclear fuel can withstand combat shock loads that are well in excess of 50 times the force of gravity, well in excess of the seismic loads a commercial plant might experience in a severe earthquake. Naval nuclear fuel routinely operates with rapid changes in power level since Naval ships must be able to change speed quickly. Naval nuclear fuel consists of solid components that are non-explosive, non-flammable, and non-corrosive. With the high integrity fuel design, fission products inside the fuel are never released into the primary coolant. This is one of the outstanding differences from commercial reactors, which normally have a small amount of fission products released from the fuel into the primary coolant.

Strict adherence to conservative principles of design and operation of Naval reactors was discussed on May 24, 1979, by the Director of Naval Nuclear Propulsion (then Admiral H. G. Rickover) in congressional testimony following the accident at Three Mile Island (House of Representatives 1979). Admiral Rickover emphasized that ensuring reactor safety is the responsibility of all personnel who work on Naval nuclear propulsion plants and that each NNPP element from training, to design, to construction, and to operation must be properly carried out in a coordinated fashion to achieve the goal of safe performance. A more thorough discussion of this topic can be found in the official history of the NNPP written by a member of the DOE historian’s staff, Francis Duncan (*Rickover and the Nuclear Navy: The Discipline of Technology*, Duncan 1990).

5.3 FACILITIES THAT SUPPORT THE NNPP

The NNPP has set standards for construction of facilities that will be used to handle or store radioactive materials. These standards prevent the spread of contamination within the facilities or to the environment, minimize exposure to personnel within the facilities, ensure that exposure to personnel outside the facilities is negligible, and minimize the effort required to decontaminate and decommission the facilities. All aspects of facilities construction and future modifications are engineered.

5.3.1 Pre-Construction and Post-Construction Radiological Surveys

To provide a baseline for radiological information on radiological work facilities, radiation surveys of the building site, and analysis of soil and building construction material samples are performed. After construction, a radiological survey of the building is performed before any radiological work is allowed in the facility. The baseline data established by these surveys is retained to provide information needed for decommissioning the facility and returning it to its pre-radiological work condition.

5.3.2 Special Design Features

Standardized design features of NNPP radiological facilities have been developed to minimize the potential risk to the environment, the general public, and workers. These features are as follows:

- ***Impermeable Floors, Walls and Liquid Containment Curbs in Radiological Work Areas.*** The floors consist of a heavy structural concrete slab topped with an impermeable surface that eliminates the possibility of migration of liquid through the floor into the underlying soils. No underground piping is permitted in or under the floors. Wherever liquids are handled, containment curbs or basins are provided to contain the largest potential spill. All floors, walls, and ceilings are smooth, free of crevices, and sealed to aid in decontamination, if necessary. Walls and roofs are tightly constructed and sealed to minimize the sources of air leakage. Doors and windows are made to be as leak tight as possible. All entrances to the building are ramped or sealed, where practicable, to prevent any potential inadvertent loss of contaminated liquids. Consideration for hurricane storm surge effects will be factored into building design and site arrangement specifications.

- ***Radiation Shielding.*** The facilities are designed so that all exterior areas and interior non-radiological support areas have radiation levels so low that monitoring personnel for radiation exposure is not required. This is achieved by the use of radiation shielding integral to the permanent walls of the facilities as well as by the use of portable shielding as work conditions dictate.

- ***Mixed Waste is Segregated and Stored in a Dedicated Storage Area.*** Mixed waste (waste that is both radiologically contaminated and hazardous) is segregated into containers that hold similar (chemically compatible) wastes.

5.3.3 Decommissioning Facilities

Due to facility design and the control of radioactivity during operation, modern NNPP facilities can be decommissioned without any residual environmental impact. Within the past two decades, three shipyards involved in Naval nuclear work have been successfully radiologically deactivated and closed. Also, one Naval nuclear prototype site has been decommissioned and returned to the State of Connecticut for unrestricted use.

From 1958 to 1980, Ingalls shipbuilding was engaged in the construction and overhaul of Naval nuclear-powered ships in Pascagoula, Mississippi. The shipyard radiological facilities that supported this work were deactivated between 1980 and 1982 by removing and disposing of all radioactive material associated with Naval nuclear propulsion plants. Extensive radiological decommissioning surveys were performed on over 274,000 square feet of building and facility surfaces. Over 11,000 samples of these surfaces as well as soil, ground cover, and concrete were taken from all areas where radioactive work was previously performed. In addition, both the State of Mississippi and the USEPA performed independent surveys of these deactivated facilities. After these surveys were completed, the Ingalls facilities were released for unrestricted use.

As at Ingalls, extensive radiological decommissioning surveys were performed at the Mare Island and Charleston Naval shipyards to verify the removal of radioactive material. These shipyards were deactivated following the 1993 round of BRAC proceedings. At each shipyard, direct radiological surveys on over 5,000,000 sf of building and facility surfaces and analyses of over 40,000 samples of soil, ground cover, and concrete using sensitive laboratory equipment detected no cobalt-60 other than trace concentrations in a few localized areas. Simple, proven cleanup methods were used to remediate these areas. The total amount of NNPP radioactivity removed from the environment at each shipyard was equivalent to that in a single home smoke detector. Both shipyards were released for unrestricted use with respect to NNPP radioactivity by the operational closure date of April 1, 1996, with State and USEPA agreement.

The successful radiological deactivation and closure of the Ingalls, Mare Island, and Charleston shipyards demonstrate that the stringent control over radioactivity exercised by the NNPP from its inception has been successful in preventing significant radiological contamination of the environment. Personnel who subsequently occupy these facilities will not receive measurable radiation exposure above natural background levels that exist in areas not affected by Naval nuclear propulsion plant work (NNPP 2007a). Since the same standards would apply to servicing and homeporting a CVN at any location, there would be no significant short- or long-term environmental impact from those activities. More recently, in October of 2006, the U.S. NNPP commemorated the first-ever unrestricted release of a U.S. nuclear power reactor site based on the absence of both chemical and radiological constituents. After operation for 34 years and training over 14,000 Sailors, the Department of Energy S1C Prototype Reactor Site in Windsor, Connecticut, was returned to “green field” conditions. NNPP personnel and contractors worked in cooperation with the Connecticut Department of Environmental Protection, the USEPA, the town of Windsor, and the public to complete the project. These agencies also provided independent oversight of the project. The current Windsor site condition makes it suitable for any future use, without restriction, from economic development to recreation.

5.4 RADIOLOGICAL IMPACT OF THE NNPP

The following discussions characterize the radiological impacts of all NNPP operations. This includes impacts due to both homeporting CVNs and operating related support facilities. As discussed below, the cumulative radiological impacts from all NNPP operations are very small and conservatively bound the impacts associated with CVN homeporting.

5.4.1 Source of Radioactivity

Nearly all (99 percent) of the radioactive atoms in a nuclear reactor are found in two forms: (1) the uranium fuel itself or (2) fission products created by the nuclear chain reaction. As discussed above, the fuel elements in Naval propulsion reactor cores are designed and built with high fuel integrity to retain this radioactivity. This high fuel integrity has been confirmed by operating experience and direct examination from spent cores. Such integrity is a necessity for Sailors who must live in the enclosed atmosphere of a nuclear-powered ship.

The remaining radioactive atoms present in a Naval nuclear reactor are encountered in two forms. The majority of the remaining radioactive atoms (99.9 percent of the remaining 1 percent) are part of the metal of the reactor plant piping and components. These radioactive atoms are created by neutron activation of iron and alloying elements during operation of the reactor plant. The balance (0.1 percent of the remaining 1 percent) is in the form of radioactive corrosion and wear products originating from metal surfaces in contact with reactor coolant. These corrosion and wear products are transported in the reactor coolant through the reactor core where they are activated by neutrons, and then deposited on piping system internal surfaces. Most of these corrosion products tightly adhere to piping system internal surfaces. The small amount that does not adhere is the source of potential radioactive contamination encountered during work on Naval nuclear reactor plants. Stringent controls are used to keep this material contained when working on system internals.

Corrosion and wear products in Naval nuclear reactor plants include the following radionuclides with half-lives of about 1 day or greater: tungsten-187, chromium-51, hafnium-181, iron-59, iron-55, nickel-63, niobium-95, zirconium-95, tantalum-182, manganese-54, cobalt-58, and cobalt-60. The predominant radionuclide is cobalt-60, which has a 5.2-year half-life and emits gamma radiation, which is one of the most penetrating forms of radiation. Cobalt-60 also has the most restrictive concentration limit in water as listed by organizations that set radiological standards for these corrosion and wear radionuclides (CFR 2007; National Council on Radiation Protection and Measurements [NCRPM] 1959). Therefore, cobalt-60 is the primary radionuclide of interest for Naval nuclear propulsion plants.

5.4.2 Control of Radioactivity

Stringent radiological control practices are used in the NNPP. The effectiveness of these stringent radiological control practices has been proven and documented (NNPP 2007b). The following discussion outlines some of the NNPP's practices for controlling radioactivity.

5.4.2.1 Surface Contamination and Radioactive Liquid

Some of the most restrictive practices in the NNPP's radiological control program are those established for controlling radioactive contamination. The controls for radioactive contamination are so strict that precautions have sometimes been taken to prevent tracking contamination from fallout and natural sources into controlled radiological work areas. This is because the control limits used in the radiological work areas are well below the levels occurring outside in general public areas.

The basic approach in the NNPP is to avoid the need for anti-contamination clothing by containing radioactivity so personnel cannot come in contact with it. Another basic requirement of contamination control is monitoring all personnel leaving an area where radioactive contamination could possibly exist. This confirms that contamination has not been spread.

Work surfaces are designed to be easily cleanable (plastic or seamless sheet metal containments) to aid in fast and effective cleanup. Work surfaces are decontaminated during and after work to maintain positive contamination control. Frequent contamination surveys are conducted during work evolutions. Results of these surveys are reviewed by supervisory personnel to provide a double-check that no abnormal conditions exist. The instruments used for these surveys are checked for operability against a radioactive source daily, and they are calibrated at least every six months.

Radioactive liquids transferred from ships are placed in collection tanks and are processed at a dock-side processing facility. After processing the water to remove cobalt-60 and other particulate radioactivity, the water is returned to the ships for use or evaporated. This process has been proven effective in the NNPP's shipyards, operating bases, and other facilities.

5.4.2.2 Airborne Radioactivity

As noted, Naval fuel elements are designed to retain all fission products, including radioactive gases. Very minute amounts of fission products are created from fission that occurs naturally in trace amounts of uranium in the fuel cladding. Because these amounts are extremely small, there is no need for special equipment to remove or control fission products.

However, special controls are used in areas where radioactive corrosion and wear products could become airborne to prevent their reaching the environment. This radioactivity is controlled during maintenance so contamination is contained and respiratory equipment is not normally required. To prevent exposure of personnel to airborne radioactivity, and to prevent radioactivity from escaping to the atmosphere, work that might generate airborne contamination is performed inside sealed containments. These containments are ventilated to the atmosphere only through HEPA filters. Airborne radioactivity surveys are performed regularly in radioactive work areas. If airborne radioactivity above the limit is detected in occupied areas, work that might be causing airborne radioactivity is immediately stopped, and the potential source is identified and fixed.

Radiological work facilities have special design features to minimize the possibility of releasing airborne radioactivity to the surrounding atmosphere. These features include walls and roofs constructed and sealed to minimize the sources of air leakage, and doors and windows made to be as leak tight as possible. These same design techniques have been used at NNPP facilities to avoid significant environmental impact from radiological work.

The results of Air Particulate Sampler (APS) monitoring show that the average concentration of radioactivity and the total radioactivity in the air released from these facilities are consistently lower than that measured in ambient air away from the monitored facilities. In other words, there is less radioactivity in the filtered air exhausted from the facility than was originally in the air brought into the facility. Releases from these work facilities cause minute levels of radiation exposure far below that allowed by the USEPA in the Code of Federal Regulation (CFR 2006). These results clearly demonstrate that the design features historically used in the facilities are effective in preventing release of airborne radioactivity.

All liquid collection tanks used to store radioactivity are sealed by mechanical closures except for one penetration. This penetration vents any small pressure build-ups caused by filling or draining or by atmospheric changes. A HEPA filter on the penetration ensures that airborne radioactivity is retained in the tanks.

5.4.3 Radiological Control Practices

Besides the contamination control practices listed above, several other key radiological control practices used by the NNPP provide additional assurance that positive control of radioactivity is maintained. Among those NNPP-wide practices are the following:

- A radioactive materials accountability system is used to ensure that no radioactive material is lost or misplaced.
- All radioactive materials are specially packaged, sealed, and tagged with yellow and magenta tags bearing the standard radiation symbol and the measured radiation level. The use of yellow packaging material is reserved solely for radioactive material.
- Access to radiological facilities is controlled by trained radiological control personnel. In addition, all personnel entering radiological work and storage areas of the facilities are required to wear dosimetry devices.
- Only specially trained personnel are authorized to handle radioactive materials.
- Radiological surveys are conducted by qualified radiological control personnel inside and outside of facilities and ships where radiological materials are handled. This is a check to verify that the methods used to control radioactivity are effective.
- Written procedures are used to perform all radiological work. This not only ensures the work is carefully planned and documented, but also allows situation- specific radiological controls to be used. All written procedures are strictly adhered to word for word (i.e., verbatim compliance) in the NNPP. If this cannot be done, work is stopped until a change to the procedure is approved.
- Radioactive material or radioactive waste transported off-site is packaged and shipped per DOT regulations. Specially trained personnel accomplish this function.
- Technical problems encountered during radiological work are documented and corrected before work is allowed to continue.

5.4.3.1 Occupational Radiation Exposure

The NNPP invokes stringent controls on occupational radiation exposure. Radiation exposure levels resulting from these controls are discussed in detail in Appendix G, and they support the position that the analyses discussed later in this section are conservative. The NNPP's policy is to reduce to as low as reasonably achievable the exposure to personnel from ionizing radiation associated with Naval nuclear propulsion plants. These stringent controls on occupational radiation exposure have been successful.

The current Federal annual occupational exposure limit of 5 rem established in 1994 came 27 years after the Naval Nuclear Propulsion Program's annual exposure limit of 5 rem per year was established in 1967. (Until 1994, the Federal radiation exposure limit allowed an accumulation of exposure of 5 rem for each year of age beyond 18.) From 1968 to 1994, no civilian or military personnel in the Program exceeded its self-imposed tighter 5 rem annual limit, and no one has exceeded that Federal limit since then. In fact, no Program personnel have exceeded 40% of the Program's annual limit between 1980 and 2006 (i.e. no personnel have exceeded 2 rem in any of the last 27 years). And no civilian or military Program personnel have ever, in over 50 years of operation, exceeded the Federal lifetime limit.

No person in the NNPP has received greater than 2 rem in a year since 1980. The average occupational exposure of each person monitored since 1954 for radiation associated with Naval nuclear propulsion plants is 0.138 rem per year. For comparison, the amount of radiation exposure a typical person in the U.S. receives each year from natural background radiation is 0.3 rem. The total lifetime average radiation exposure from radiation associated with Naval nuclear propulsion plants for this 52 year period is 1.13 rem per person (NNPP 2007b).

In the late 1980s, the NCRPM reviewed occupational exposures to the U.S. working population (NCRPM 1989). This included a review of the occupational exposures to personnel from the NNPP. Based on this review, the NCRPM concluded: "These small values (of occupational exposure) reflect the success of the Navy's efforts to keep doses as low as reasonably achievable."

5.4.3.2 Radioactive Solid Waste Disposal

The amount of low-level radioactive solid waste generated during Naval ship and maintenance facility operations is small in comparison to other waste generators. This waste includes radioactively contaminated rags, plastic bags, paper, filters, ion exchange resin, and scrap materials resulting from work aboard ship and in the shore-side support facilities. Liquids that cannot be processed for reuse are solidified and properly disposed of. This waste is packaged in DOT-approved containers, shielded if necessary and accumulated in a controlled storage area until it can be shipped for disposal at a burial site that is licensed either by the NRC or by a State under agreement with the NRC.

The annual volume of solid low-level radioactive waste generated by all Naval nuclear-powered ships and their support facilities in 2005 is about 0.5 percent of the total volume disposed of at U.S. commercial disposal sites (NNPP 2007a). The amount of radioactive waste that would be generated by the Navy at CVN homeport facilities would be a small fraction of the Navy total.

5.4.3.3 Mixed Hazardous and Radioactive Waste

Hazardous waste is waste that poses a potential threat to human health or the environment if not properly managed. These substances can be toxic, corrosive, ignitable, or chemically reactive (note that this does not include radioactive substances regulated under the Atomic Energy Act). Radioactive waste is a waste that contains radionuclides regulated under the Atomic Energy Act. Mixed waste generated as a result of NNPP activities is a mixture of chemically hazardous waste and low-level radioactive waste. Within the NNPP, concerted efforts are taken to prevent commingling radioactive and chemically hazardous substances to minimize the potential for generation of mixed waste. Examples of these efforts include avoiding the use of hazardous solvents, lead-based paints, and lead shielding in disposal containers. As a result of NNPP efforts to avoid the use of chemically hazardous substances in radiological work, NNPP activities typically generate each year less than 20 cubic meters of mixed waste that requires offsite treatment following completion of onsite processing. Small quantities of mixed waste generated as a result of NNPP activities at NAVSTA Mayport would be stored in accordance with federal and state hazardous waste regulations. Limited treatment allowed by generators of hazardous waste may be performed on some mixed wastes. This treatment would be performed in accordance with federal and state regulations. Mixed wastes would be stored on-site pending off-site shipments for treatment and disposal. Due to the small quantities generated of mixed waste that would be generated at NAVSTA Mayport, these wastes would be expected to be stored for greater than 90 days to facilitate efficient operations, therefore a modification to the existing permit for storage of hazardous waste at NAVSTA Mayport would be requested to allow storage of the mixed waste. Implementing the proposed action would not result in an increase in the total amount of mixed waste generated as a result of NNPP worldwide activities. Moreover, detailed characterization of NNPP mixed waste has been accomplished using sampling and extensive process knowledge, and has confirmed that the waste is suitable for safe storage until it is shipped off site for treatment and disposal (NNPP 2007a).

5.4.3.4 Radioactive Material Transportation

Only specially trained, designated people who are knowledgeable in shipping regulations are permitted to authorize shipments of radioactive material. Special transportation services, such as signature security service or sealed shipping vehicles used exclusively to transport radioactive material, ensure point-to-point control and traceability are maintained from shipper to receiver.

Shipments of radioactive material in the NNPP are made per regulations of the DOT, DOE, and NRC. These regulations ensure shipments of radioactive material are controlled to protect the environment and the health and safety of the general public, regardless of the transportation route taken.

Shipments of radioactive material associated with Naval nuclear propulsion plants have not resulted in any measurable release of radioactivity to the environment. There have never been any accidents involving a significant release of radioactivity during shipment of NNPP radioactive waste. In particular, the NNPP has shipped low-level radioactive material since the 1950s with no release of radioactivity.

Estimates of annual radiation exposure to transportation crews and the general public from shipments of radioactive material have been made in a manner consistent with that used by the NRC (ANSR 2002). As discussed in reference NNPP 2007a, NNPP shipments have not resulted in any significant exposure to the general population. The maximum exposure to any individual member of the public is far less than that received from natural background radioactivity.

5.4.4 Radiological Environmental Monitoring Program

To provide additional assurance that procedures used by the U.S. Navy to control radioactivity are adequate to protect the environment, the Navy conducts environmental monitoring in harbors frequented by its nuclear-powered ships. Environmental monitoring surveys for radioactivity are periodically performed in harbors where U.S. naval nuclear-powered ships are built or overhauled and where these ships have homeports or operating bases. Samples from each harbor monitored are also checked at least annually by a DOE laboratory to provide a further check on the quality of the environmental sample analyses as a check of Navy results. The DOE laboratory findings have been consistent with those of the shipyards.

5.4.4.1 Marine Monitoring

Marine monitoring consists of analyzing harbor water, sediment, and marine life for radioactivity associated with Naval nuclear propulsion plants. This monitoring is supplemented by shoreline surveys.

Sampling harbor water and sediment each quarter year is emphasized since these materials would be the most likely to be affected by releases of radioactivity.

Sediment samples are collected and analyzed specifically for the presence of cobalt-60, which, as discussed earlier, is the predominant radionuclide of environmental interest resulting from Naval nuclear reactor operations. Sampling points are selected to form a pattern around ship berthing locations and to provide points in areas away from berthing locations. These sampling points consider characteristics of the harbor. Summary of 2006 surveys for cobalt-60 sampling show that most harbors do not have detectable levels of cobalt-60 in sediment. The detectable level of cobalt-60 for Navy radiological surveys is 0.01 picocuries per gram. The actual value varies depending on the amount of naturally occurring radioactivity in the survey sample. Low levels of cobalt-60, less than three millionths of a microcurie per gram, are detected around a few operating base and shipyard piers where nuclear-powered ship maintenance and overhauls were conducted in the early 1960s. These low levels are well below the naturally occurring radioactivity levels in these harbors. A measure of significance of these low levels is that if all of a person's food were to contain three millionths of a microcurie of cobalt-60 per gram, that person would receive less than 10 percent of the annual dose one gets from natural background radiation. Since 1970, nuclear-powered warship operations have not caused any increase in the general background radioactivity in the environment.

Harbor water samples are taken once each quarter in areas where nuclear-powered ships are berthed, and from upstream and downstream locations. No cobalt-60 has been detected in any of the water samples from all the harbors monitored.

Marine-life samples, such as mollusks, crustaceans, and plants, have been taken from all harbors monitored. No buildup of cobalt-60 has been detected in these samples of marine life.

Shoreline areas uncovered at low tide are surveyed with sensitive gamma scintillation detectors to determine if any radioactivity from bottom sediment has washed ashore. The results of these surveys are consistent with natural background radiation levels in these regions. Thus, there is no evidence that these areas are being affected by nuclear-powered ship operations.

5.4.4.2 Air Monitoring

Naval nuclear reactors and their support facilities are designed to ensure that discharges of radioactivity are well below USEPA regulatory limits (CFR 2006) in airborne exhausts. Radiological controls such as the use of containments, special ventilation, frequent radiological monitoring when work is in progress, frequent decontamination of work containments to maintain positive control of radioactive contamination, and HEPA filtration systems serve to prevent significant radioactivity from becoming airborne. The total air emission from any facility and its co-located ships is less than 1 percent of the applicable USEPA (CFR 2006) limits. In fact, comparison of sensitive radioactivity measurements in shipyards demonstrates that air exhausted from Naval nuclear propulsion facilities contained a smaller amount of radioactivity than was present in the ambient air outside the facilities.

5.4.4.3 Perimeter Monitoring

Ambient radiation levels are measured using sensitive thermoluminescent dosimeters continuously posted at locations outside of the boundaries of areas where radiological work is performed. Dosimeters are also posted at locations away from radiological work areas to measure background radiation levels from natural radioactivity. The results show that NNPP activities have had no distinguishable effect on normal background radiation levels at the perimeter of the work sites.

5.4.4.4 Independent Agency Monitoring

Environmental samples from each harbor monitored are also independently checked at least annually by a DOE laboratory to ensure that analytical procedures are correct and standardized. Additionally, the USEPA has conducted independent surveys in U.S. harbors, including areas on both the east and west coast (USEPA 1998b, USEPA 1999d, USEPA 2001a, USEPA 2001b, USEPA 2003b, USEPA 2004, USEPA 2005a, USEPA 2005b). The results are consistent with Navy monitoring results cited in NNPP 2007a. These surveys have confirmed that Naval nuclear-powered ships and their support facilities have had no adverse impact on the radioactivity of the marine or terrestrial environment.

5.4.4.5 Results of Environmental Monitoring

The Navy issues an annual report that describes the Navy's policies and practices regarding such issues as disposal of radioactive liquid, transportation and disposal of radioactive materials and solid wastes, and monitoring of the environment to determine the effect of nuclear-powered warship operations (NNPP 2007a). This report is provided to Congress and to cognizant federal, state, and local officials in areas frequented by nuclear-powered ships. This report shows that the total amount of long-lived gamma radioactivity released into harbors and seas within 12 miles of shore has been less than 0.002 curies during each of the last 36 years.

NRC regulation (10 CFR 20) lists water concentration limits for discharge of radioactivity in effluents. These limits are based on limiting the dose to members of the public from continuous ingestion of the activity discharged to 50 millirem per year. The control of radioactive liquid discharges at Navy facilities is much more stringent than at facilities that comply with the limits of 10 CFR 20, such as commercial nuclear power plants. The total combined radioactivity discharged from all Navy nuclear-powered vessels annually within 12 miles of shore is less than one hundredth of the amount of radioactivity released by one typical commercial nuclear power plant. To put this small quantity of radioactivity into perspective, it is less than the quantity of naturally occurring radioactivity in the volume of harbor salt water occupied by a single Naval nuclear-powered submarine.

As a measure of the significance of this data, if one person were able to drink the entire amount of radioactivity discharged into any harbor in any of the last 36 years by U.S. nuclear-powered warships and support facilities, that person would not exceed the annual radiation exposure permitted for an individual worker by the NRC.

Since 1973, the total long-lived gamma radioactivity released farther than 12 miles from shore by Naval nuclear-powered ships and supporting tenders has been less than or equal to 0.4 curie per year. This is the total amount released from over 100 ships at different times of the year in the open sea at long distances from land in small incremental amounts, and under rapid dispersal conditions due to wave action. This 0.4 curie is less than the naturally occurring radioactivity in a cube of seawater approximately 100 yards on a side.

This data can be extrapolated to a CVN. The procedures used to operate and service a nuclear-powered CVN are based on the same principles used to develop those for U.S. nuclear-powered ships at any time in the past or any place in the world. Thus, homeporting a CVN would have no significant radiological environmental effect, and no adverse impact on the health and safety of the public.

5.5 EMERGENCY PREPAREDNESS

Naval reactors are designed and operated in a manner that is protective of the crew, the public, and the environment. It is important to note that the crew lives in very close proximity to the reactor and is dependent on the energy generated by the reactor for air, water, heat, and propulsion. Thus, it is imperative to both the Navy and the crew that the reactor be well designed and safely operated. An equally important part of ensuring safety is developing, exercising, and evaluating the ability to respond to any emergency in the highly unlikely event one does occur.

Planning for emergencies is based on extensive Naval Nuclear Propulsion Program technical analysis, as well as recommendations and guidance provided by numerous agencies experienced in emergency planning, including the Department of Homeland Security (Federal Emergency Management Agency), the Navy, the Department of Energy, the Nuclear Regulatory Commission, the Environmental Protection Agency, the National Council on Radiation Protection and Measurements, and the International Atomic Energy Agency. Naval Reactors is the Federal Coordinating Agency under the National Response Plan for radiological emergencies involving Naval Nuclear Propulsion Program facilities and transportation accidents involving radiological or nuclear material generated from Naval Nuclear Propulsion Program operations. As such, Naval Reactors could call upon the extensive resources of the federal emergency response network, if ever needed. Emergency planning for the public is based on the above guidance, as well as specific planning requirements of local civil authorities.

All Naval Nuclear Propulsion Program activities, both shipboard and ashore, have plans in place that define Naval Nuclear Propulsion Program responses to a wide range of emergency situations. These plans are regularly exercised to ensure that proficiency is maintained. These exercises consistently demonstrate that Naval Nuclear Propulsion Program personnel are well prepared to respond to emergencies regardless of location. Actions are taken to continually evaluate and improve emergency preparedness at all Naval Nuclear Propulsion Program activities.

If there ever were a radiological emergency, civil authorities would be promptly notified and kept fully informed of the situation. With the support of Naval Nuclear Propulsion Program personnel, local civil authorities would determine appropriate public actions, if any, and communicate this information via their normal emergency communication methods.

The Naval Nuclear Propulsion Program maintains close relationships with civil authorities to ensure communications and emergency response are coordinated, if ever needed. Successful exercises have been conducted with all States that host U. S. nuclear-powered warships and facilities, demonstrating the Navy's commitment to work as a team in response to emergency situations.

Due to the unique design and operating conditions of U.S. nuclear-powered ships, civil emergency response plans that are sufficient for protecting the public from industrial and natural events (for example, chemical spills or earthquakes) are also sufficient to protect the public in the highly unlikely event of an emergency onboard a nuclear-powered ship or at a Naval Nuclear Propulsion Program facility.

5.6 OVERVIEW OF RADIOLOGICAL IMPACT ANALYSES AND HEALTH EFFECTS

This chapter has discussed at length the history and philosophy of the NNPP to illustrate the absence of any notable radiological impact associated with homeporting CVNs. Discussion has centered on the small amount of radioactive material that has been released during normal operations and the conservative nature of naval fuel design and facilities design that make the likelihood of accidents and their consequences extremely small. Nonetheless, the radiological impacts of normal operations and facility accidents on the environment and exposure to the general public were evaluated at NAVSTA Mayport. These evaluations were performed taking into account local meteorological data, population, water movements, and other factors that could influence severity of an accident using a computer-programmed pathways analysis. A detailed discussion of analysis methods is contained in Appendix H. Estimated environmental consequences, event probabilities, and risk for both normal operations and postulated accident scenarios related to the homeporting of CVNs are presented.

5.6.1 Potential for Release of Radioactive Material to the Environment

Normal operations and accidents at support facilities were evaluated to estimate the potential for releases of radioactive material. The results of these analyses are presented in terms of the health effects to facility workers and the public as predicted due to the hypothetical release of radioactive materials into the environment. Additional discussion on radiation exposure and risk is provided in Appendix G, which supports the position that these analyses are conservative. Effects on environmental factors are also presented, based on the amount of land that could be impacted due to postulated accidents. The detailed analyses of normal operations and accident conditions for radiological support facilities are presented in Appendix H. The radioactive material release source term for normal operations was conservatively estimated for the NIMITZ-class aircraft carrier based on procedures approved by the USEPA for compliance with 40 CFR 61.

Accidents were considered for inclusion in detailed analyses if they were expected to contribute substantially to risk (defined as the product of the probability of occurrence of the accident and the consequence of the accident). The following example serves to illustrate the calculation of risk. The lifetime risk of dying in a motor vehicle accident can be computed from the likelihood of an individual being in an automobile accident and the consequences or number of fatalities per accident. There were 6,181,000 motor vehicle accidents during 2004 in the U.S. resulting in about 42,636 deaths (National Highway Traffic Safety Administration 2006). Thus, the probability of a person being in an automobile accident is 6,181,000 accidents divided by approximately 300,000,000 persons in the U.S., or 0.02 per year. The number of fatalities per accident, 0.007 (42,636 deaths divided by 6,181,000 accidents), is less than 1 since many accidents do not cause fatalities. Multiplying the probability of the accident (0.02 per year) by the consequences of the accident (0.007 deaths per accident) by the number of years the person is exposed to the risk (77.5 years is considered to be an average lifetime as of 2003 (Hoyert *et. al*. 2006)) gives the risk for any individual being killed in an automobile accident. From this calculation, the overall risk of someone dying in a motor vehicle accident is about 1 chance in 92 over their lifetime. Further perspective on the calculation of risk can be found in section 1.5 of Appendix H.

Accidents were categorized into three types: Abnormal Events, Design Basis Accidents, or Beyond Design Basis Accidents. These categories are characterized by their probability of occurrence as described further in section 2.6 of Appendix H. Construction and industrial accidents are included in these categories. Two hypothetical accidents were analyzed using area specific data. The first scenario is a fire in a radiological support facility that spreads to radioactive material resulting in an airborne release of radioactivity. The second scenario is a spill into surrounding waters of radioactive liquid from a collection facility.

5.6.1.1 Normal Operation

This section summarizes the detailed pathways analyses performed in Appendix H to determine the radiological impact of normal operations based on one CVN added to NAVSTA Mayport by this EIS. A detailed discussion of how the analyses were performed is contained in Appendix H.

Table 5.6-1 presents the estimated risk of fatal cancer to the general population and individuals at NAVSTA Mayport due to radiological releases from normal operations. The normal incidence of cancer for a typical population has been included for comparison. Details for deriving data in Table 5.6-1 are described in Appendix H. The radiation exposure to the general public would be so small at NAVSTA Mayport that it would be indistinguishable from naturally occurring from normal operations background radiation. The results show that the additional annual individual risk of a latent fatal cancer (LFC) occurring in the general population within 50 miles of NAVSTA Mayport is very low, less than 1 chance in 3.3 billion.

Table 5.6-1 Radiological Health Effects from Normal Operations

Location	**Total Radiation Exposure to Affected Population[1]**	**Annual Risk of Single LFC in Entire Affected Population[2]**	**Population Estimate Within 50 Miles of NAVSTA Mayport[3]**	**Average Annual Risk of LFC to a Member of the General Population[4]**	**Individual Annual Risk of LFC for Maximally Exposed Off-Site Individual[5]**	**An Individual's Annual Risk of Dying from all Cancers [6]**
NAVSTA Mayport	0.9 (9×10^{-1})	1 in 2,326 (4.3×10^{-4})	1,393,489	1 in 3.3 billion (3.1×10^{-10})	1 in 29 million (3.5×10^{-8})	1 in 360 (2.8×10^{-3})

Notes
1. Total exposure to general population within a 50-mile radius of the facility due to normal operation (person-rem).
2. Annual risk of a single latent fatal cancer in entire affected population within a 50-mile radius of the facility from radiation exposure due to normal operation is calculated by multiplying the total radiation exposure to affected population (rem) by 0.0005 latent fatal cancers estimated to be caused by each rem (risk/rem; see Table H-3 in Appendix H).
3. Estimated number of people within a 50-mile radius of the facility from census data in Table H-4
4. Average annual risk of latent fatal cancer for an average individual within a 50-mile radius of the facility from radiation exposure due to normal operation is calculated by dividing the total population cancer risk by the number of people within a 50- mile radius of the homeport location. Risk of cancer is noted in parentheses.
5. The MOI is a theoretical individual living at the base boundary receiving maximum exposure, calculated by multiplying the total radiation exposure to the MOI (rem; see Table H-11 of Appendix H) by 0.0005 latent fatal cancers estimated to be caused by each rem (see Table H-3 in Appendix H)
6. Annual risk of an individual dying from all sources of cancer. Risk of cancer is noted in parentheses.

5.6.1.2 Hypothetical Accidents

<u>Accident Selection and Scope</u>

Natural and human initiated accidents were considered but only those accidents expected to contribute substantially to risk (defined as the product of the probability of occurrence of the accident multiplied by the consequence of the accident) were included for detailed analysis. In addition, before an accident was considered for detailed analysis, radioactive material associated with the accident had to be in a dispersible form and there had to be a way to release and disperse the material.

Categories of accidents, which are described in Appendix H and include industrial and catastrophic accidents, are characterized by their probability of occurrence. The probability of an accident's occurrence contributed significantly to whether the accident was included for detailed analysis. Accidents with minimal consequences, such as small-volume releases, procedural violations, and other human errors, occur more frequently than accidents with severe consequences. Accidents with low probability of occurrence but more severe consequences, such as acts of terrorism, plane crashes, and natural disasters (like earthquakes or hurricane storm surge), are expected to result in risks that are bounded by the results of facility accidents that were evaluated in detail. The facility accidents found to have the highest risk were a fire in a radiological support facility and a release of radiological liquid (spill) from a support facility. Both accidents are analyzed in detail in Appendix H.

Although the probability of occurrence is very small, a wide range of postulated reactor accidents has been analyzed and are discussed in Appendix I. Consistent with independent reviews by the NRC and ACRS, the analyses have shown that CVN reactors can be safely operated.

For facility accidents, the scope of radiological impact as related to the size of the area contaminated was determined. The spread of contamination was calculated using average meteorological conditions (note that 95 percent worst case meteorology was used when calculating exposure and risk to workers and the general population). For the fire accident scenario the contaminated area was confined to the boundaries of NAVSTA Mayport. For the spill accident, the footprint was not calculated due to the rapid dilution below detectable levels of radioactive material after entering surrounding waters. Any radiological impact on the contaminated area would be temporary while the area was isolated and remediation efforts were completed.

<u>Summary of Accidents Selected for Detailed Analysis</u>

Fire

The accident with the most risk is a fire in a radiological support facility that results in the airborne release of radioactivity. The amount of radioactivity released during this accident scenario was conservatively established at 1 curie of cobalt-60 and the associated proportional amounts of other radioactive elements expected. Note that this amount of activity is more than 500 times the annual amount released to harbors within the 12-mile coastal waters by the entire nuclear navy. This represents a conservative amount of radioactivity that might be released in a fire, as compared to the typical amount that might accumulate within a support facility due to normal operations. For the analysis, several conservative assumptions were used, as follows:

- The meteorological conditions are considered to be 95 percent worst case (with no credit given that the likelihood of these conditions is only 1 chance in 20).

- No evacuation of the public or cleanup of contaminated areas is assumed.

These assumptions are conservative since radioactive material storage facilities are specifically constructed to inhibit the spread of fire and have automatic sprinkler systems installed. Moreover, emergency response measures include provisions for immediate response to any emergency, identification of the accident conditions, and communications with state and local authorities.

This section summarizes the detailed pathways analyses, performed in Appendix H, which determined the radiological impact of a fire at radiological support facilities. Table 5.6-2 presents the estimated risk of cancer to the general population and individuals due to radiological releases resulting from a fire at support facilities. The risks presented in this section result from extremely conservative assumptions and analyses. A fire is the highest risk, most severe hypothetical accident, but its risk is still considered low when compared to other risks. Latent cancer fatalities are not expected in the general public as a result of this hypothetical radiological fire. The average annual individual risk of latent fatal cancer to the general public living within a 50-mile radius of NAVSTA Mayport due to a fire is very low, less than one chance in 1 billion.

Table 5.6-2 Summary of Radiological Support Facility Fire Results

Location	Total Radiation Exposure to Affected Population from a Fire, Assuming Fire Occurs [1]	Annual Risk of Single LFC in Entire Affected Population from a Fire, Including Probability of Fire Occurring [2]	Population Estimate Within 50 Miles of NAVSTA Mayport [3]	Average Annual Risk of LFC to a Member of the General Population from a Fire, Including Probability of Fire Occurring [4]	Individual Annual Risk of LFC for a Maximally Exposed Off-Site Individual from a Fire Including Probability of Fire Occurring [5]	An Individual's Annual Risk of Dying from all Cancers [6]
NAVSTA Mayport	540 person-rem	1 in 770 (1.3×10^{-3})	1,393,489	1 in 1 billion (9.6×10^{-10})	1 in 1 million (9.7×10^{-7})	1 in 360 (2.8×10^{-3})

Notes

1. This is the total exposure to affected population within a 50-mile radius of the facility due to a fire (person-rem).
2. Annual risk of a single latent fatal cancer in the affected population within a 50-mile radius of the facility from radiation exposure due to a fire is calculated by multiplying the total radiation exposure to affected population (rem) by 0.0005 latent fatal cancers estimated to be caused by each rem (see Table H-3 in Appendix H) by a 1 in 200 (0.005) probability of a fire.
3. This is the estimated number of people within a 50-mile radius of the facility from census data in Table H-4 in Appendix H
4. Average annual risk of latent fatal cancer for an average individual within a 50-mile radius of the facility from radiation exposure due to a fire is calculated by dividing the affected population cancer risk by the number of people within a 50- mile radius of the home port location. Risk of cancer is noted in parentheses.
5. The MOI is a theoretical individual living at the base boundary receiving maximum exposure. Risk is calculated by multiplying the total radiation exposure to the MOI (rem, see Table H-11 of Appendix H) by 0.0005 latent fatal cancers estimated to be caused by each rem (see Table H-3 in Appendix H) by a 1 in 200 (0.005) probability of a spill.
6. This is the annual risk of an individual dying from all sources of cancer. Risk of cancer is noted in parentheses.

Spill

The next accident with the most risk is a spill of radioactive liquid from a collection facility into surrounding waters. The released radioactivity is evaluated for transfer from the location of release to the general public through tidal movements, ingestion by fish and crustaceans. The amount of water release was assumed to contain 1 curie of cobalt-60 and the associated proportioned amounts of other radioactive elements expected. These assumptions are conservative since it would require a spill of over 26 million gallons of radioactive liquid (discharged primary coolant) at levels normally contained in collection facilities. The total capacity to store radioactive liquid at support facilities typically would be less than 100,000 gallons.

This section summarizes the detailed pathways analyses performed in Appendix H, which determined the radiological impact of a release of radiological liquid from support facilities. Table 5.6-3 presents the estimated risk of cancer to the general population and individuals due to radiological releases resulting from a release of radiological liquid from a support facility. The risks presented in this section result from extremely conservative assumptions and analyses. The risk from a spill is less than a fire and is also considered low when compared to other risks. Latent cancer fatalities are not expected in the general public. The average annual individual risk of latent fatal cancer to the general public living within a 50-mile radius of NAVSTA Mayport is very low, less than 1 chance in 120 billion.

5.6.1.3 Accident Response

Although the risk of a radiological accident of significant consequence is small, emergency plans are in place at all Naval nuclear facilities to mitigate the impacts of an accident. These plans include activation of emergency control organizations throughout the NNPP to provide on-scene response as well as support for the on-scene response team. Realistic training exercises are conducted periodically to ensure that the response organizations maintain a high level of readiness and to ensure that coordination and communication lines with local authorities and other federal and state agencies are effective. Emergency response measures include provisions for immediate response to any emergency at any naval site, identification of the accident conditions, and communication with civil authorities providing radiological data and recommendations for any appropriate protective action. In the event of an accident involving radioactive or mixed-waste materials, workers in the vicinity of the accident would promptly seek shelter to minimize exposure and aid in emergency response consistent with the site's emergency plan for responding to fires and hazardous material incidents. This typically occurs within minutes of the accident and reduces the hazard to workers.

Table 5.6-3 Summary of Radiological Support Facility Release of Radioactive Liquid Results

Location	Total Radiation Exposure to Affected Population from a Spill, Assuming Spill Occurs [1]	Annual Risk of Single Latent Fatal Cancer in Entire Affected Population from a Spill, Including Probability of Spill Occurring[2]	Population Estimate Within 50 Miles of NAVSTA Mayport [3]	Average Annual Risk of Latent Fatal Cancer to a Member of the General Population from a Spill, Including Probability of Spill Occurring [4]	Individual Annual Risk of Latent Fatal Cancer for Maximally Exposed Off-Site Individual from a Spill, Including Probability of Spill Occurring[5]	An Individual's Annual Risk of Dying from all Cancers[6]
NAVSTA Mayport	240 person -rem	1 in 84,000 (1.2×10^{-5})	1,393,489	1 in 120 billion (8.6×10^{-12})	1 in 6 billion (1.7×10^{-10})	1 in 360 (2.8×10^{-3})

Notes
1. This is the total exposure to general population within a 50-mile radius of the facility due to a spill (person-rem).
2. Annual risk of a single latent fatal cancer in affected population within a 50-mile radius of the facility from radiation exposure due to a spill is calculated by multiplying the total radiation exposure to affected population (rem) by 0.0005 latent fatal cancers estimated to be caused by each rem (risk/rem; see Table H-3 in Appendix H) by a 1 in 10,000 (0.0001) probability of a spill.
3. This is the estimated number of people within a 50-mile radius of the facility from census data in Table H-4 in Appendix H
4. Average annual risk of latent fatal cancer for an average individual within a 50-mile radius of the facility from radiation exposure due to a spill is calculated by dividing the total population cancer risk by the number of people within a 50- mile radius of the home port location. Risk of cancer is noted in parentheses.
5. The MOI is a theoretical individual living at the base boundary receiving maximum exposure. Risk is calculated by multiplying the total radiation exposure to the MOI (rem; see Table H-11 of Appendix H) by 0.0005 latent fatal cancers estimated to be caused by each rem (risk/rem; see Table H-3 in Appendix H) by a 1 in 10,000 (0.0001) probability of a spill.
6. This is the annual risk of an individual dying from all sources of cancer. Risk of cancer is noted in parentheses.

While the Navy would recommend appropriate actions to protect the public if needed based on Federal guidance (EPA 400-R-92-001), State and local officials would be responsible for determining and implementing protective actions for the general public outside of the Naval base. In the highly unlikely event that some radioactivity escapes from the Naval base, the radioactivity would still only affect areas close to the release, and the exposure to the public would be localized and not severe. As such the need for the State and local officials to take protective actions is extremely low. However, in the highly unlikely event that some action were necessary, existing civil emergency response plans in place for handling industrial and natural events (for example, chemical spills or hurricanes) are more than sufficient to protect the public in response to a radiological emergency originating from the Naval base.

5.6.2 Impact on Specific Populations

5.6.2.1 Impact on Workers

The impact to workers involved in radiological support facility operations due to the postulated radiological accidents has been evaluated. This evaluation focused on the radiological consequences of the fire accident. Clearly, a limited number of fatalities may occur that are related to operations and support only in a secondary manner; i.e., the worker who happened to be in the facility may be killed due to a fire. These secondary effects are not discussed in the evaluation. Rather, only radiological consequences are considered. It is not likely that any adverse impact to the health of nearby workers would occur due to the radiological consequences of this fire accident. At most, a few workers might receive some radiation exposure from inhalation of airborne radioactivity during the initial stages of the fire; however, the involved workers would likely move to a position upwind of the fire, put on breathing apparatus, or evacuate the area in accordance with emergency procedures and training.

For the spill accident, the water would drain from the tank and rapidly enter the water pathway. In addition, wet spills result in very small amounts of airborne activity. It is not likely that any adverse impact to the health of nearby workers would occur due to radiological consequences of this spill accident.

5.6.2.2 Impact on Environmental Justice in Minority and Low Income Populations

As discussed in the preceding sections, the impacts on human health or the environment resulting from normal operations associated with support facility operations for CVNs would be small. For example, it is unlikely that a single additional fatal cancer would occur as a result of these activities. Since the potential impacts due to normal operations or accident conditions present no significant risk and do not constitute a credible adverse impact on the surrounding population, no adverse effects would be expected for any particular segment of the population, minorities and low-income groups included.

The conclusion that there would be no disproportionately high and adverse impacts on human health or the environment is not affected by the prevailing winds or direction of surface and subsurface water flow. This is true for normal operations because the effects of routine operations are so small. It is also true for accident conditions because the consequences of any accident would depend on the conditions at the time it occurred and the wind directions do not display any strongly dominant directions. Similarly, the conclusion is not affected by concerns related to subsistence consumption of fish and game since the sites are not located in areas that serve as a major source of food for any specific group.

To place the impacts on environmental justice in perspective, the risk would be less than one additional fatality per year for the entire population from CVN support operations. Even if all of the additional impacts were assumed to occur solely among minorities and low income populations, no additional latent cancer fatalities are expected to occur in the population from carrier support operations. Thus, the cancer risk would not constitute disproportionately high and adverse impacts on human health or the environment.

5.7 SUMMARY

The NNPP provides comprehensive technical management of all aspects of Naval nuclear propulsion plant design, construction, and operation including careful consideration of reactor safety, radiological, environmental and emergency planning concerns. The record of the NNPP's environmental and radiological performance at the operating bases and shipyards presently used by nuclear-powered warships demonstrates the continued effectiveness of this management philosophy. This effectiveness is demonstrated by the fact that through the entire history of the Program – over 5,900 reactor years of operation and more than 137 million miles steamed on nuclear power – there has never been a reactor accident, nor any release of radioactivity that has had an adverse effect on human health or the quality of the environment.

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CHAPTER 6
CUMULATIVE EFFECTS

A cumulative impact is the additive or interactive effect on the environment that could result from the incremental impact of the alternatives when added to other past, present, or reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Interactive effects may be either countervailing (where the net adverse cumulative effect is less than the sum of individual effects) or synergistic (where the net adverse cumulative effect is greater than the sum of the individual effects). Cumulative impacts can result from individually minor but collectively significant actions that take place over time. Accordingly, a cumulative impact analysis identifies and defines the scope of other actions and their interrelationship with the alternatives (or grouping of alternatives) if there is an overlap in space and time. Cumulative impacts are most likely to occur when there is an overlapping geographic location and a coincident or sequential timing of events. Because the environmental analysis required under NEPA is forward-looking, the aggregate effect of past actions is analyzed to the extent relevant and useful in analyzing whether the reasonably foreseeable effects of the alternatives (or grouping of alternatives) may have a continuing, additive and significant relationship to those effects.

For this EIS, an approach to analyzing cumulative impact analysis was developed to be consistent with guidance documents issued by CEQ, *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997), and USEPA, *Consideration Of Cumulative Impacts In USEPA Review of NEPA Documents*, (USEPA 1999c) as well as CEQ's additional *Guidance on the Consideration of Past Actions in Cumulative Effects Analysis* (CEQ 2005). The following approach was used:

1. For each resource area addressed in Chapters 3 and 4, the potential for cumulative effects to these resources from the action alternatives in combination with other past, present, or reasonably foreseeable future actions was assessed.
2. For those resource areas that were determined to have potential for cumulative effects, an appropriate geographic scope (or geographic study area) for the cumulative impacts analysis for that resource was determined.
3. Within the geographic study area for each resource, past, present, or future actions having the potential for additive and/or interactive effects were identified.
4. The cumulative impacts of the past, present, and future actions in combination with the impacts assessed for the alternative sets (i.e., Chapter 4) was then assessed. This assessment considered

synergistic and countervailing impacts and identified whether the cumulative impacts on resources was adverse or beneficial and minor, moderate, or significant.

6.1 EARTH RESOURCES

6.1.1 Description of Geographic Study Area

The geographic study area for earth resources includes NAVSTA Mayport where development would occur as well as the NAVSTA Mayport turning basin and entrance channel, Jacksonville Harbor Bar Cut 3 federal navigation channel, Jacksonville ODMDS, and Fernandina ODMDS.

6.1.2 Relevant Past and Present Actions

Past and present actions at NAVSTA Mayport have had the effect of disrupting and compacting soils and topography from their natural states. The effect does not meaningfully contribute to continuing and/or reasonably foreseeable significant impacts to soil resources or topography. Past and present actions have had no discernible impact to the underlying geological condition of the study area.

As first noted in Section 2.3.1, the Navy currently removes approximately 900,000 cy of sediment from the NAVSTA Mayport turning basin and entrance channel every two years as part of its maintenance dredging program. Most of this material has been disposed of in the Jacksonville ODMDS. Jacksonville ODMDS has been in use since 1952 and NAVSTA Mayport has used the ODMDS regularly since 1954. Fernandina ODMDS was designated by USEPA in March 1987 and is primarily used for disposal of dredged material from the Submarine Base Kings Bay Entrance Channel.

JAXPORT has deepened the St. Johns River shipping channel, which extends from the inlet to Talleyrand Marine Terminal to a maintained depth of -40 ft MLLW. Dredged material from this portion of the federal channel is currently disposed of at West Bartram Island or East Bartram Island upland disposal sites, Buck Island where material is recycled for beneficial use, along the shoreline for beach nourishment (starting at the jetties and working south), or in Jacksonville ODMDS.

Table 6.1-1 summarizes the volume of dredge material placed in the Jacksonville ODMDS through 2008; material disposed prior to the early 1970s was disposed in an area 0.5 nm east of the Jacksonville ODMDS. In the late 1970’s material was disposed south of the site (USEPA and USACE 2007). Table 6.1-2 summarizes the volume of dredge material placed in the Fernandina ODMDS through 2006.

Table 6.1-1 Volume of Dredged Material Placed in the Jacksonville ODMDS

Year	**Dredged Material Quantity – Cubic Yards (paid *in situ* volume)**			
	Jacksonville Federal Navigation Channel	**NAVSTA Mayport (permit)**	**Jacksonville Shipyards (permit)**	**Total**
1952-1970[1]	4,461,594	3,992,997	0	8,454,591
1971-1980[1]	2,652,407	3,048,844	0	5,707,851
1985[2]	15,800	0	0	15,800
1986[2]	0	0	109,700	109,700
1987[2]	82,200	0	26,500	108,700
1988[2]	210,500	0	0	210,500
1996[3]	0	659,623	0	659,623
1997[3]	0	439,748	0	439,748
2000[3]	0	887,284	0	887,284
2001[4]	0	174,832	0	174,832
2002[3]	0	225,200	0	225,200
2003[3]	560,446*	905,328	0	1,465,774
2005[3]	0	59,667	0	59,667
2006[3]	0	888,134	0	888,134
2007	510,000	0	0	510,000
2008	0	635,000	0	635,000
Total 1996-2008	**1,070,446**	**4,874,816**	**136,200**	**5,945,262**

Source: USEPA and USACE 2007
[1]Data from Jacksonville ODMDS EIS (USEPA 1983), in USEPA and USACE 2007
[2]Data from the USACE Ocean Disposal Database, in USEPA and USACE 2007
[3]Data from the Jacksonville District Dredge Information System –paid in situ volumes, in USEPA and USACE 2007
[4]Data from the Jacksonville District Post Disposal Monitoring Reports, in USEPA and USACE 2007
**Previously identified as 910,001 cy "permitted"(vice "paid in situ") for disposal, which resulted in a total 2003 volume of 1,815,329 cy instead of 1,465,774 cy and a total 1996-2006 volume of 5,149,817cy instead of 4,800,262 cy as identified in the table.*

Table 6.1-2 Volume of Dredged Material Placed in the Fernandina ODMDS

Year	**Dredged Material Quantity – Cubic Yards**		
	Fernandina Harbor Inner Channel & Turning Basin	**Kings Bay Entrance Channel**	**Year Total**
1987	0	0	0
1988	0	6,320,029	6,320,029
1989	0	156,425	156,425
1990	0	886,786	886,786
1991	0	297,497	297,497
1992	0	33,037	33,037
1993	0	495,875	495,875
1994	943,183	222,538	1,165,721
1995	0	215,349	215,349
1996	0	606,097	606,097
1997	0	162,667	162,667
1998	0	225,853	225,853
Total	**943,193**	**9,622,153**	**10,565,336**

Source: USEPA and USACE 1998

6.1.3 Relevant Future Actions

NAVSTA Mayport Future Development. Future development that may occur at NAVSTA Mayport as a result of other ongoing development and/or recapitalization efforts would continue to disturb the soils and topography. Specifics of future projects are not foreseeable at this time; however, NAVSTA Mayport is essentially developed to its capacity. That is, land that is developable and not constrained by airfield, explosive safety, and natural or cultural resource conservation, has been fully developed. Therefore, additional development would not be expected to result in meaningfully greater conversion of soils and topography. Because of environmental management controls, such as stormwater management, soils would be stabilized following construction activities and no long-term accelerated erosion of topsoil would be expected.

Project XL/ENVVEST. NAVSTA Mayport, under a USEPA Project XL/ENVVEST initiative, is evaluating the potential to remove, to the greatest extent possible, 8 million cy of dewatered dredge material located within the existing 200-acre upland disposal sites at NAVSTA Mayport. Potential beneficial reuse applications include parks and recreation (golf course applications); agriculture, horticulture, and forestry; strip mine reclamation and landfill cover for solid waste; industrial/commercial development; and material transfer for fill and engineered products (NAVSTA Mayport 2007a). If this were to occur, there would be localized impacts to soils and topography at the upland disposal sites. Project XL/ENVVEST seeks innovative methods to reuse the existing dredged material in an effort to empty the current holding cells so that future maintenance dredging material can be placed in the cells thereby minimizing offshore disposal. A self-sustaining program would be implemented that would alternate use of the two holding cells between mining the dewatered material and filling the other cell with dredged material.

With or without implementation of the dredging associated with the Group 2 and Group 3 alternatives, the Navy requires maintenance dredging of the NAVSTA Mayport turning basin and entrance channel on an ongoing basis. With or without the Jacksonville Harbor deepening project detailed below, there is also ongoing maintenance dredging requirements for the Jacksonville Harbor. In addition, there is ongoing dredging in the Submarine Base Kings Bay Entrance Channel and Turning Basin. All projects would generate ongoing requirements for dredge material disposal, most of which is currently disposed of in either the Jacksonville or Fernandina ODMDS. Due to increased depth of the proposed dredging, the Navy's maintenance dredging requirements would be expected to increase by approximately 27,500 cy per year, based on sediment transport modeling to predict future maintenance dredge requirements.

Port of Jacksonville Deepening. The USACE Jacksonville District and JAXPORT are cooperating in studying the feasibility of further deepening the Port of Jacksonville. A Supplemental EIS for the Jacksonville Harbor Navigation Study, General Re-Evaluation Report is being prepared to supplement the Jacksonville Harbor Navigation Improvements EIS completed in November 1998. The objectives of the study are to:

- determine if light loading of ships, tidal delay, or other commercial navigation benefits exist to justify additional deepening below the existing -40 ft project depth from the entrance channel to river mile 20 and for Cuts F and G of the West Blount Island Channel;

- evaluate measures including widening along the Trout River Cut Range, and Quarantine (Bartram) Island Upper Range which would reduce navigation concerns and improve ship traffic safety; examine the impact of channel deepening on the capacity of existing upland confined disposal facilities and the offshore dredge material disposal site; evaluate new upland confined disposal facilities, if required;

- determine if beneficial uses of dredged material such as manufactured soils, recycling of dredged material for construction fill, development of artificial reefs, or use of beach quality material for placement along adjacent beaches would provide appropriate alternatives for disposal of dredged material;

- evaluate the impact of deepening and widening measures on shoaling rates for existing and advanced harbor maintenance needs;

- examine the hydrodynamic and environmental effects of the deepening and widening measures on Chicopit Bay, White Shells Bay, Mill Cove, and adjacent harbor shorelines; identify environmental and cultural resources in the study area and potential impacts from deepening or widening to those resources; and

- identify, from the National Economic Development plan for Jacksonville Harbor, which recommendations most efficiently and safely accommodate existing and larger commercial ship and barge traffic while avoiding or minimizing impacts to environmental resources.

The Draft Supplemental EIS will consider the possible effects of blasting on aquatic resources, loss of wetlands from expansion of upland disposal areas at Bartram Island, as well as other project-related impacts on protected species, water quality, fish and wildlife resources, cultural resources, essential fish habitat, socioeconomic resources, coastal processes, aesthetics and recreation, and other impacts identified through scoping, public involvement, and agency coordination. It is estimated that the Draft Supplemental EIS will be available to the public in the fall 2010 (DoD 2007a). The Jacksonville Harbor deepening project includes proposed rebuilding and relocating the Mile Point training wall and construction of a short-cut widener and Trout River widener.

6.1.4 Cumulative Impact Analysis

The combined impact of any of the action alternatives or the No Action Alternative and the actions identified above would not result in additive adverse cumulative impacts to soils, topography, geology, or beaches. The deepening project associated with the Group 2 and 3 alternatives does not extend inward to the Jacksonville Harbor beyond the NAVSTA Mayport entrance channel. Interactive impacts to bathymetry would occur at the confluence of the two projects.

There are potential significant cumulative impacts with regard to dredge material capacity at the offshore disposal sites. Past and ongoing dredging and disposal of maintenance dredged material has resulted in permanent decreases in capacity at the ODMDSs. Ongoing and future dredging projects at NAVSTA Mayport and in the Jacksonville region would have additive impacts with the dredging that would occur under the Group 2 and 3 alternatives. As assessed in Section 4.1, the deepening of the NAVSTA Mayport turning basin, entrance channel, and Jacksonville Harbor Bar Cut 3 federal navigation channel, would result in siltation rates similar but slightly higher than to that which occurs during the regular maintenance dredging. The initial round of maintenance dredging after this proposal's dredging may involve a larger amount of shoal_material before stabilization of the area occurs. Continued maintenance dredging material disposal will decrease available capacity at the offshore disposal sites, and the possible deepening of the USACE Federal Navigation Project would further reduce available capacity at the offshore disposal sites.

As first noted in Section 2.3.1, both the Jacksonville and Fernandina ODMDS currently have capacity limitations. The Jacksonville ODMDS, being one fourth the size of Fernandina ODMDS, is the most capacity constrained. Given the continuing need for dredge material disposal and the shortfall in upland disposal options for NAVSTA Mayport and other marine users of the St. Johns River, additional capacity for the ocean disposal of dredged material is likely necessary. Concerns about the limitation of capacity at these ODMDSs are reflected in the ongoing need to have an annual restriction of 2 million cy for Jacksonville ODMDS and informal goal not to exceed 1 million cy for Fernandina ODMDS, pending re-evaluation of each site's capacity. Assessing the feasibility of expanding existing ODMDS or creating a new ocean disposal site is warranted given the cumulative impacts of ongoing dredging and dredged material disposal in the region.

Negative consequences on dredged material disposal and site capacity may occur when Group 2 and 3 alternatives are considered in conjunction with other past, present, and foreseeable future regional dredging projects. The Navy has been working with USACE, USEPA, and local agencies in establishing sufficient dredged material disposal sites for long-term disposal of dredged materials in the Mayport area and this is expected to offset the cumulative impact. To minimize these adverse cumulative impacts the following are recommended: expanding existing ODMDSs; identifying new off-shore and/or inland disposal sites; expanding renourishment activities; and researching beneficial reuse under Project XL/ENVVEST in order to minimize use of the ocean disposal sites.

6.2 LAND AND OFFSHORE USE

6.2.1 Description of Geographic Study Area

The geographic study area of land and natural resource management and use is the same study area described in Section 3.2, but is expanded to include all of the Mayport Road corridor to Atlantic Boulevard, Kathryn Abbey Hanna Park, and City of Atlantic Beach to the South, Huguenot Park and all of Fanning Island and the Heckscher Drive commercial and mixed use development to the north, and City of Jacksonville westward to San Pablo Road.

6.2.2 Relevant Past and Present Actions

Village of Mayport Community and Economic Development. As detailed in Section 3.7, NAVSTA Mayport is important in the history of Jacksonville. The Village of Mayport is the oldest, continually occupied community in Duval County. In the mid-1800s, it was home to fishermen, harbor bar pilots, and the largest sawmill in Duval County. Towards the end of the 19th century, Mayport was a village of 600 people and consisted of some Minorcan descendants and beaches lined with cottages. Until recent decades, it remained a fishing village with few city services. Tourists visited the Village of Mayport for sport fishing, boating, sightseeing, and access to the nightlife in nearby resort communities of Atlantic Beach and St. Augustine. In 1967, the Village of Mayport became part of the consolidated Jacksonville-Duval County government (Hardy Heck Moore Inc. 2001). Today, the Village of Mayport continues to support commercial fishing, provides service industries for those who live and work at NAVSTA Mayport, and has developed some sport fishing and casino boat tourism industries.

Two revitalization efforts are underway in the area: (1) Mayport Waterfront Partnership and (2) Mayport Community Redevelopment Area. The Mayport Waterfront Partnership was created by the cities of Atlantic Beach and Jacksonville in 1997 to bring economic revitalizing to the eastern shore of Duval County. The Partnership's zone of interest includes the North Jacksonville barrier islands, the Village of Mayport, and Ft. George and Fanning Islands. In 1998, the State of Florida designated the Village of Mayport as one of the first three waterfront communities in need of revitalization. In recent years, the Partnership oversaw the installation of a $4.2 million sanitary sewer line and the upgrading of water lines in the commercial section of the Village of Mayport. Also, the Waterfront Partnership wrote and sponsored the Mayport Village Overlay Zone Regulations, which provide protection for characteristics unique to the village (City of Jacksonville 2007g). The Mayport Community Redevelopment Area is also being considered for redevelopment of the Mayport Road Corridor. Florida State Statute, Chapter 163, allows municipalities to designate areas for redevelopment and provides for a source of funds and tools for this redevelopment. The area must meet certain standards to be considered for designation and must create a Redevelopment Plan to guide redevelopment. The Mayport Road Corridor Study (City of Jacksonville and City of Atlantic Beach 2006) was undertaken in order to prepare a new redevelopment strategy for the commercial parcels which front on Mayport Road. The study documents the current condition of the area and makes suggestions on how redevelopment could create a new development pattern, which is both functional and visually enhanced. The redevelopment opportunities for the Mayport Road Corridor are focused on access management, landscaping/streetscape, redevelopment potential, and new development pattern.

The goal for housing in the region is to preserve the existing housing stock while encouraging affordable new development that is consistent with the overall mixed use, medium density character of the neighborhoods. Objectives are to improve building and zoning code enforcement, encourage quality multi-family development, increase homeownership, decrease investor ownership of single-family and mobile homes, and encourage the renovation of existing single-family homes. The housing strategy recommends use of either an existing non-profit developer or creating a new non-profit developer for acquisition, rehabilitation, and resale of vacant and abandoned homes. The cities can also target and acquire slum rental property for rehabilitation and resale or demolition and redevelopment by this non-profit developer. Incentives also allow the properties to be affordable to a range of income levels to ensure an income mix.

The goal for transportation is to develop a more pedestrian- and cyclist-friendly environment while ensuring a traffic flow that is both constant and safe. The recreation goal is to preserve existing and encourage new recreation opportunities in the Mayport Road area. The economic development goal is to encourage more small- and large-scale retail oriented commercial uses along Mayport Road that would increase employment opportunities for local residents. The aesthetics and urban design goal suggest a more aesthetically pleasing atmosphere that capitalizes on the unique character of the Village of Mayport community. The land use and development/redevelopment goal preserves the existing residential areas that are above dilapidated condition, while encouraging the development of a wide range of uses that contribute to the overall health of the Mayport community.

NAVSTA Mayport Recapitalization. Existing land uses at NAVSTA Mayport are the result of planned development of facilities and activities to support the military mission during the course of the last 70 years (refer to Section 3.7 for a detailed history of NAVSTA Mayport development). Recent construction completed at NAVSTA Mayport (in federal fiscal years 2005 and 2006) has included a security fence with towers, a new medical/dental clinic, a new 260-room bachelor enlisted quarters , runway resurfacing, and an air traffic control tower (NAVSTA Mayport 2006a). Completion of the medical/dental clinic created available space in the old medical/dental clinic, which was occupied by various administrative functions. NAVSTA Mayport is now constructing the new bachelors enlisted quarters that will have 78 modules, each module has two sleeping rooms, supporting two personnel per room. The total capacity of the new bachelor enlisted quarters will be 312 personnel (McVann 2007a).

Encroachment and NAVSTA Mayport Encroachment Action Plan. NAVSTA Mayport has developed an Encroachment Action Plan to address installation encroachment issues on an ongoing basis. Among the issues of concern is the potential development of condominiums and associated services in the Village of Mayport (see "Village of Mayport Redevelopment" under Section 6.2.3). High rise buildings could pose threats to air navigation and safety, and overall development could conflict with the noise generated by operations at the air station. Another potential encroachment concern is that NAVSTA Mayport does not have a non-development agreement with the city that would help ensure that compatible surrounding land uses and consistency with the City of Jacksonville Huguenot Park and the Navy AICUZ. Aircraft fly directly over the park when approaching NAVSTA Mayport from the Atlantic. New housing developments are encroaching on the southern border of the installation west of Hanna Park and State Route A1A; and the Queens Harbor and Yacht Club is a high-priced gated community located southwest of the installation on the western side of the Intracoastal Waterway (DoN 2007b).

Navy Fleet Training in the Jacksonville Range Complex. An EIS/Overseas Environmental Impact Statement (OEIS) is being prepared to evaluate the potential environmental effects associated with U.S. Fleet Forces naval training in the Jacksonville Range Complex as part of the Navy TAP. The Navy proposes to support current and emerging training operations and research, development, testing, and evaluation activities at the range complex by: (1) maintaining baseline operations at current levels; (2) increasing training operations from current levels as necessary to support the Fleet Readiness Training Plan; (3) accommodating mission requirements associated with force structure changes; and (4) implementing enhanced range complex capabilities. The EIS/OEIS study area is the Jacksonville Range Complex which consists of sea-based targets and instrumented areas, airspace, surface and subsurface operations, and land range facilities. Together the range complex encompasses: 27 square miles of land; 62,596 square nm (about 72,000 square miles) of special use airspace; and 50,090 square nm (about 58,000 square miles) of sea space. Three alternatives are being evaluated in the EIS/OEIS including: (1) the No Action Alternative comprising baseline operations and support of existing range capabilities; (2) Alternative 1 composed of the No Action Alternative plus additional operations, expanded warfare missions, accommodating force structure changes including training resulting from the introduction of new vessels, aircraft, and weapons systems, and implementing enhancements to range infrastructure; and (3) Alternative 2, comprising Alternative 1 plus additional increases in training, and implementation of enhancements that optimize training throughput in support of future contingencies. No decision will be made to implement any alternative until the EIS process is completed and a Record of Decision is signed by the Assistant Secretary of the Navy (Installations and Environment). The Notice of Intent for the EIS appeared in the *Federal Register* on 26 January 2007 (DoD 2007b) and the DEIS was released for public comment on 27 June 2008.

6.2.3 Relevant Future Actions

NAVSTA Mayport Planned Development. NAVSTA Mayport has plans for an addition to the physical fitness center, additional parking, recapitalization of Wharfs B and C, an addition to the SERMC facility, and aircraft refueling facilities. The NAVSTA Mayport master plan establishes a plan for continued orderly growth and development of NAVSTA Mayport. When land use constraints are taken into account, the installation is nearly completely built-out. Therefore, the master plan focuses on recapitalization efforts. Future mission activities at NAVSTA Mayport could include the homeporting of the new littoral combat ship (LCS). The HSV2, a Navy-leased ship that may serve as a potential platform for the LCS, has recently been used by U.S. Navy Southern Command operations out of NAVSTA Mayport (Clark 2007).

DDG-1000 Homeporting. NAVSTA Mayport is being considered by the Navy as the potential homeport for three of the new Zumwalt class destroyers (commonly referred to as DDG-1000) scheduled for delivery to the fleet beginning in 2012. NAVSTA Mayport is an alternative location, the Preferred

Alternative is to homeport the DDG-1000 at NAVSTA Norfolk on the East Coast (3 ships) and NAVSTA San Diego on the West Coast (3 ships). As one of five Navy installations currently homeporting destroyers, NAVSTA Mayport provides similar infrastructure and support capabilities required for the new class of ship. If selected as the homeport, minor construction would be required to upgrade two additional berths to provide 4,160V shore power.

Navy Undersea Warfare Training Range (USWTR). The Navy is proposing to establish an instrumented undersea warfare training range off the East Coast of the United States for anti-submarine warfare training. A notice of availability of the Draft EIS/OEIS (USEPA 2008d) and notice of public hearings (DoN 2008c) was published in the *Federal Register* on 12 September 2008. The USWTR would cover 500 square nm of the ocean and would enable the Navy to train effectively in a shallow-water environment at a suitable location for Atlantic Fleet units. The range would be equipped with undersea cables and sensor nodes, and would be connected by a single trunk cable to a landside cable termination facility. Siting of the USWTR offshore of northeastern Florida is the Navy's Preferred Alternative. This USWTR site includes a small portion of the Jacksonville Operating Area, much further offshore than the Jacksonville ODMDS. The western edge of the range would be located approximately 50 nm off the coast of Jacksonville. The USWTR would allow ships, submarines, and aircraft to perform anti-submarine warfare training in littoral, or near shore, waters. Installation of the USWTR at this site would entail the placement of approximately 300 transducer nodes in water depths ranging from approximately 120 to 1,200 ft, over an approximate 500-square nm area. The interconnect cable between each node may be buried in the shallower depths due to potential entanglement concerns with bottom-trawling fishing gear. In deeper waters, the interconnect cable would not be buried. A trunk cable connecting the range to the shore facilities would be buried (including within U.S. territory) to a depth of approximately 3 ft. There would be two segments to the buried-trunk cable. One segment would run from the shore to a junction box offshore (the cable would be buried; the junction box would not be buried). From this junction box a second buried-cable segment would run to another junction box located at the edge of the underwater sea range. Ocean-bottom burial equipment would be used to cut (hard bottom) or plow (soft sediment) a furrow approximately 4 inches wide in which the 2.3-inch cable would be placed, starting from the undersea exit point of the conduit. Cable installation would be accomplished using a tracked, remotely operated cable burial vehicle. The cable would run approximately 50 nm from the edge of the range to land at NAVSTA Mayport. Commercial power and telecommunications connections would be made to the NAVSTA Mayport infrastructure (DoN 2008d).

Atlantic Fleet Active Sonar Training (AFAST). The Navy has prepared an EIS to analyze the potential impacts of designating areas along the East Coast and within the Gulf of Mexico where the majority of

Atlantic Fleet active sonar training would be conducted, including areas where mid- and high-frequency active sonar and explosive source sonobuoy training, maintenance, and research, development, testing, and evaluation activities would occur. A notice of availability of the DEIS and public hearings was published in the *Federal Register* on 15 February 2008 (DoN 2008e). Training exercises would include Independent Unit Level Training, Coordinated Unit Level Training, and Strike Group Training exercises. During these events, surface ships, submarines, and aircraft would utilize a number of active and passive sonar systems, as well as other training devices for Anti-submarine Warfare, Mine Warfare, and related active sonar training. The EIS evaluates the No Action Alternative and three action Alternatives. The No Action Alternative is the Navy's Preferred Alternative. Under the No Action Alternative, the Navy would continue sonobuoy training within and adjacent to Operating Areas along the East Coast and the Gulf of Mexico rather than designate active sonar areas. Active sonar activities currently occur in areas that maximize active sonar opportunities and meet operational requirements. Critical habitat for the NRW and National Marine Sanctuaries are avoided during training. Alternative 1 would designate fixed active sonar areas along the East Coast and the Gulf of Mexico based on operational requirements and a surrogate environmental analysis. The environmental analysis identified areas with a relatively higher potential for marine mammal exposure to sonar. Alternative 2 would designate seasonal active sonar training areas based on operational requirements and qualitative and geographical environmental analysis. The seasonal marine mammal exposure data was compared to Alternative 1 active sonar areas resulting in reduction of some training areas during the spring and winter and the addition of some training areas during fall and summer. Under Alternative 3, active sonar activities would not be conducted in environmentally sensitive areas (those areas with specific features which would indicate a higher concentration of marine species) offshore of the East Coast and the Gulf of Mexico to the extent possible while still meeting operational requirements. The Jacksonville Operating Area is currently utilized for active sonar training and would continue to be utilized under all the action alternatives. The designated active sonar area immediately surrounding NAVSTA Mayport would not change appreciably under any of the action alternatives (DoN 2008f). The Navy's schedule is to release the FEIS/OEIS in December 2008 and issue a Record of Decision in January 2009 (DoN 2008g).

MHPI at NAVSTA Mayport. The MHPI enacted on 10 February 1996 as part of the National Defense Authorization Act for FY 1996, allows the DoD and DoN to work with the private sector to upgrade the quality of family housing and operate and maintain that housing (CNIC 2008). The housing assets are typically leveraged with private investment to accomplish housing construction and renovation goals faster and at a lower cost than military construction. GMH Communities Trust has entered into a 50-year agreement for the design, construction, management, and maintenance of 11 Navy bases located in five states throughout the Southeastern U.S. (GMH Communities Trust 2007). This includes the 1,165 family housing units at NAVSTA Mayport (GMH Communities Trust 2007 and 2008).

The Defense Authorization Bill in FY 2003, authorized DoN to pursue no more than three unaccompanied housing (i.e., bachelor) privatization pilot projects (CNIC 2008) and NAVSTA Mayport is the site of one of these projects (Grone 2007). The bachelor housing privatization project is currently under evaluation.

Community Residential Development. There are plans to convert land near NAVSTA Mayport that was formerly occupied by mobile home parks into condominiums. At the Lakeside site (located approximately 0.5 miles west of the State Route A1A/ Mayport Road intersection) plans call for 534 two- and three-bedroom condominiums. At Fiddler's Reef (located on an approximately 30-acre site on the east side of Mayport Road, bordering Hanna Park) approximately 500 two- and three-bedroom condominiums have been planned. The developer estimates prices for these condominiums would range between $140,000 and $190,000 (Florida Times Union 2007a). At the Ocean Village site (located approximately 1.5 miles north of the Atlantic Boulevard and State Route A1A/Mayport Road), a 312-unit market-rate apartment complex is planned. Additionally, at the Broadstone site (located further south in Jacksonville Beach south of Beach Boulevard near Penman Road), a 228-unit market-rate apartment complex is being planned (Burmeister 2008). Finally, The Palms (a seven-acre site of former apartments located at the intersection of Atlantic Boulevard and State Route A1A/Mayport Road) has been slated for redevelopment into market-rate apartments or condominiums (Dixon 2007).

Community Affordable Housing Initiatives. Despite the recent downturn in the housing market, there is a shortfall in affordable housing in Duval County, particularly in the Beaches area (local term for Atlantic Beach, Neptune Beach, and Jacksonville Beach areas). Numerous apartment complexes and mobile home parks have been sold due to soaring property values, redevelopment, and condominium conversions. An estimated 800 affordable housing units, particularly in the Mayport Road area, have been lost in recent years creating a deficit of affordable housing (in the monthly rent range of approximately $550 to $750) (Dixon 2008, Funkhauser 2008). Various initiatives are underway to address the lack of affordable housing in the Village of Mayport and the Duval County Beaches area.

Habitat for Humanity is constructing 32 affordable housing units on a four-acre site located at the southwest corner of Florida State Route A1A and Mayport Road. Ground was broken for this project in March 2008 (Dixon 2008). Helping Hands Ministry, a faith-based organization, has an option on two plus acres west of Mayport Road where they estimate sufficient space to build 18 townhomes on this property. Helping Hands Ministries is partnering with Beaches Habitat for Humanity to build the townhomes (Helping Hands Ministries of Atlantic Beach 2008).

An approximately nine-acre land area that belonged to the Jacksonville Parks and Recreation Department, but was never used as a park, has been declared surplus by the City so that it can be used for affordable homes. The land is located about three blocks north of where Florida State Route A1A turns west toward the Village of Mayport, near Hanna Park, and south of NAVSTA Mayport. Jacksonville housing department began soliciting development proposals for a workforce housing complex in December 2006 for families that are struggling to find affordable homes in the Beaches area. The target for the housing is families with household incomes of 50 to 120 percent of the area median income. Developers are being given creative latitude on the site plan's design and density as long as the proposal involves high-quality affordable housing compatible with the surrounding area, maintains as much green space as possible, and does not exceed seven units per acre. However, preliminary surveys show about half the nine acres contain wetlands, which will limit the number of units (Burmeister 2006).

New JAXPORT Cruise Terminal. JAXPORT constructed a temporary cruise terminal at an existing cargo berth located at the northwestern end of the Dames Point Marine Terminal (see Figure 3.8-1) as a short-term measure to quickly accommodate Celebrity Cruises' decision in March 2003 to homeport a vessel in Jacksonville as a market test beginning in October 2003. The facility was designed as a temporary fix until a site for a permanent terminal location could be identified. For the permanent terminal, JAXPORT is seeking sites east of the Dames Point Bridge (State Route 9A over the St. Johns River, see Figure 1.1-1) in order to accommodate newer and larger cruise ships. Cruise ships must pass beneath JEA electric power lines at Blount Island and the Dames Point Bridge, which limits the height of ships that can sail to the temporary cruise terminal. The clearance for the power lines and the bridge is 175 ft. According to JAXPORT, the trend in the cruise industry is to build larger cruise ships, some exceeding 190 ft in height. JAXPORT anticipates the smaller cruise ships which do meet the height restrictions will eventually be phased out, possibly resulting in Jacksonville losing the cruise business. Once a permanent terminal is established, JAXPORT plans to convert the temporary cruise terminal into a cargo-handling facility, a strategy planned when the temporary facility was designed in 2003 (JAXPORT 2008).

In fall 2004, potential locations for a permanent cruise terminal were evaluated along the entire length of the St. Johns River from Mayport to the JEA power lines. Currently, JAXPORT is reviewing the results of the recent studies of potential cruise terminal sites and economic impacts of the cruise industry in Jacksonville. One possibility is locating a cruise terminal at Mayport, but JAXPORT is still compiling all the information needed to make a decision on whether or not to proceed with a project. Recently, private property owners in Mayport approached JAXPORT, indicating their willingness to sell riverfront property adjacent to the St. Johns River Ferry operations, and JAXPORT subsequently acquired these properties (JAXPORT 2008). These include a property that had been slated for high-end condominium development and a local shrimper's property. JAXPORT also recently acquired property in the area as a result of assuming the operation of the St. John's Ferry (see Section 6.8.3).

After JAXPORT acquired these properties, they began studying the feasibility of locating a new cruise terminal at Mayport. The concept under evaluation would occupy approximately 8 acres (about 10 percent of the Village of Mayport's 80 acres) and consist of a terminal area, single ship's berth, and parking garages. If JAXPORT moves forward with plans for a cruise terminal at Mayport, JAXPORT has stated that the history and flavor of the area will play a major role in the architecture chosen and in the preservation of a working waterfront. JAXPORT has stated that a Cruise Terminal at Mayport would require 24-hour security which would be heightened while a ship is in port, but this security would not require local residents to pass through any security checkpoints during the regular course of their day. Besides the area occupied by the terminal and ship's berth, there is no intention to restrict public access to the waterfront, unless security issues must be addressed while a ship is actually docked at the terminal. JAXPORT is evaluating environmental issues, including any need for environmental remediation, waste management, and protection of the St. Johns River (JAXPORT 2008).

JAXPORT's Board of Directors will ultimately make the decision on how to proceed, but no timetable for a decision has been established. JAXPORT staff will continue to research the feasibility issues noted above as well as the ability to obtain a concrete cruise industry commitment to Jacksonville as a home port (JAXPORT 2008).

6.2.4 Cumulative Impact Analysis

NAVSTA Mayport recapitalization, in combination with the alternatives that proposed new construction (particularly the Group 3 alternatives that propose the CVN nuclear propulsion plant maintenance facilities) would be expected to have the combined effect of higher utilization rates for buildable lands and facilities at NAVSTA Mayport. For those alternatives that do not result in new construction and would result in a loss of net daily population at NAVSTA Mayport (Alternatives 2, 3, and 9), there would likely be lower utilization rates of lands and facilities throughout the installation. Additional facilities may be demolished, as personnel are consolidated into common facilities, as practicable. Ongoing and additional mission requirements as a result of the possible LCS homeporting or Jacksonville Range

Complex training could affect land uses supporting mission activities at NAVSTA Mayport. The impacts of the USWTR to NAVSTA Mayport, if the site offshore at Jacksonville is chosen, would be highly localized to the cable connection site. Offshore use changes resulting from training operations within the Jacksonville Range Complex including those associated with AFAST and USWTR would be minimal, as US Fleet Forces currently conduct training exercises in the complex. The specifics of LCS or DDG-1000 homeporting are not identifiable at this time, but they would not be likely to result in large-scale changes in the pattern of land use at NAVSTA Mayport. Overall, regardless of alternative and in consideration of cumulative effects, the cumulative impacts would not be adverse nor change land use in such a way that mission-essential operations are degraded and, therefore, would not be significant.

As assessed in Section 4.2, changes to off-Station land use could occur as an indirect effect resulting from the gain or losses in personnel and associated dependents under the Group 1, 2, and 3 action alternatives and No Action Alternative. The land use transitions that are occurring due to the projects listed in Section 6.2.3, including conversion of mobile home communities to market-priced apartments and condominiums, potential cruise terminal development, and various efforts to address the lack of affordable housing in the area would have interactive impacts with the homeporting alternatives. With those alternatives that would result in a loss in personnel and dependent populations (all Group 1 and 2 alternatives, Alternatives 4 and 8 from Group 3, and the No Action Alternative), the Navy's influence on local land use patterns would be expected to diminish. That is, the businesses that specifically cater to the Navy population and Navy families would be affected because this population would live in fewer local neighborhoods. Therefore, the land use transitions would be expected to be further influenced by the economic influences of the Beaches-area real estate market and businesses that cater to the immigration of Beaches residents. For those alternatives that would result in the greatest reductions in NAVSTA Mayport's population by 2014 (Alternatives 3 and 7 and the No Action Alternative), there would be no deficit in on-Station bachelor housing. This could contribute to a reduction in overall demand for off-Station housing and corresponding demand effects (i.e., rental rates). For those alternatives that would result in an increase in the net daily population and associated dependent population (Alternative 12 from Group 3), the Navy would continue its ongoing influence on local land use. There would be additive impacts associated with the immigration of Beaches residents to the area and additional Navy personnel working at NAVSTA Mayport and residing in the neighborhoods. Although bachelor enlisted quarters would be provided to house most low-ranking enlisted personnel, the lack of affordable housing in the area likely would be exacerbated by the increased Navy population which would have an income level unable to afford much of the housing in the Village of Mayport and Beaches area. The development of additional bachelor housing through the MHPI would offset the impact. The parks and conservation areas in the vicinity of NAVSTA Mayport, detailed in Section 3.2, would continue to provide for open space and outdoor recreation opportunity in the area.

Potential encroachment issues for NAVSTA Mayport would be expected to change with development and be more pronounced with Alternatives 12, which results in growth in NAVSTA Mayport population. The completion and implementation of the Encroachment Action Plan for NAVSTA Mayport; however, would be expected to address these issues and ensure that development in the adjacent community is compatible with the military mission.

The development of a cruise terminal at NAVSTA Mayport would potentially result in direct and indirect land use changes in terms of land use and land use density from development of the approximately 8-acre site for a terminal, plus any transportation improvements and service-type businesses that might develop near the terminal site. The land use of this area is currently Community/General Commercial, as is much of Village of Mayport. Changes in land use would be in accordance with the City of Jacksonville's Village of Mayport Overlay District, which as noted in Section 3.2.1, was established the to recognize the Village of Mayport area as a unique residential and commercial community within Duval County.

In addition, the various transportation projects listed in Section 6.8.3 have a cumulative impact with land use changes. The completion of the Mayport flyover ramp included with it some local changes to businesses and housing areas in the immediate vicinity of the ramp. The Wonderwood Connector opens a new thoroughfare used routinely by various Duval County residents and visitors to the area. Such transportation developments are often associated with the influx of new businesses that cater to the new commuting population. If the St. Johns River_Ferry service was discontinued, this could result in the closure of local business that rely on ferry traffic (see also, Section 6.9.3). All of these transitions would have additive and interactive effects with the alternatives analyzed in this FEIS similar to, and in combination with, the land use effects described in the preceding paragraph.

Regardless of alternative, the cumulative impact to land use would not be significant. All new development would be subject to the land use and development regulations of the City of Jacksonville and City of Atlantic Beach. Although localized rezoning would be expected with some of the larger actions, the overall result would not be expected to be inconsistent or in conflict with the environmental goals, objectives, or guidelines of the City of Jacksonville or City of Atlantic Beach. The potential exception is affordable housing and the alternatives that would increase the Navy population in the area under Alternative 12. Alternative 12, in combination with other actions in the area that have reduced the affordable housing stock, could hinder attainment of affordable housing goals stated in the City of

Jacksonville 2010 Comprehensive Plan (City of Jacksonville 2004/2005) and City of Atlantic Beach 2015 Comprehensive Plan (City of Atlantic Beach 2004). Implementation of MHPI bachelor housing would have a countervailing impact.

6.3 WATER RESOURCES

6.3.1 Description of Geographic Study Area

The geographic study area for cumulative impacts to water resources includes the NAVSTA Mayport turning basin and entrance channel and the federal navigation channel, Jacksonville Harbor Bar Cut 3 federal navigation channel, Jacksonville ODMDS, Fernandina ODMDS, upland surface waters, and FEMA floodplain at NAVSTA Mayport. Because there is no impact to groundwater or wetlands associated with any of the alternatives in this FEIS, no cumulative effects to these resources are assessed.

6.3.2 Relevant Past and Present Actions

Past Development at NAVSTA Mayport. The dredging of Ribault Bay to create the NAVSTA Mayport turning basin and development at the installation over the years have has localized effects to the water resources. The history of this development is detailed in Section 3.7. A limited amount of past development at NAVSTA Mayport has occurred within the 100-year FEMA floodplain (see Figure 3.3-2).

St. Johns River Water Quality. Within the study area, past and present actions have affected the St. Johns River water quality. Studies have identified either high nutrient concentrations or eutrophic conditions in the lower St. Johns River. A combination of point and nonpoint source pollution has increased the within-basin nutrient load to the Lower St. Johns River to 2.4 times over natural background levels for total nitrogen and 6 times for total phosphorous. Areal nutrient loading, at 9.7 and 2.1 kilograms of nitrogen and phosphorus per hectare of watershed contributing area per year within the Lower St. Johns River Basin is one of the highest reported from studies in the southeastern United States. Point sources are the greatest contributor of the man-made nutrient load from within the river basin. However, due to the entry of this load nearer to the mouth of the river, its incremental effect is presumed to be less than that caused by nonpoint sources and upper and middle St. Johns River loads which enter upstream. Changes in the amounts of river algae appear to correlate significantly with changes in inorganic nitrogen and dissolved oxygen, suggesting that algae use much of the nitrogen supplied to them for growth. During this cycle of growth and ultimate death, the algae exert a dominant influence over river oxygen content.

New TMDL Regulations for the Lower St. Johns River. A TMDL is the maximum amount of a given pollutant that a water body can absorb and still maintain its designated uses. Under Section 303(d) of the federal Clean Water Act and the Florida Watershed Restoration Act, TMDLs must be developed for all waters that are not meeting their designated uses and, consequently, are defined as "impaired waters" (FDEP 2003). The Lower St. Johns River was included on the 1998 303(d) list as impaired waters for nutrients based on elevated chlorophyll-a levels (algal blooms) (FDEP 2006). FDEP established the new TMDL regulations for the Lower St. Johns River Basin in December 2007. The next step is to approve the Basin Management Action Plan, which describes how the stakeholders will achieve the required TMDL. NAVSTA Mayport will have a specific allocation for both stormwater and wastewater. Nitrogen is the pollutant of concern in the Lower St. Johns River Basin for NAVSTA Mayport (Dombrosky 2007).

Dredging. As first discussed in Section 6.1.2, the Navy currently dredges the NAVSTA Mayport turning basin and entrance channel every two years as part of its maintenance dredging program. Most of this material has been disposed of in the Jacksonville ODMDS; the Fernandina ODMDS is primarily used for dredged material from the Submarine Base Kings Bay Entrance Channel.

The River Accord. The River Accord is a 10-year partnership initiative designed to repair the health of the lower basin of the St. Johns River. The City of Jacksonville, SJRWMD, JEA, Water Sewer Expansion Authority, and FDEP are members of The River Accord. Together, these partners are committing $700 million to reduce the amount of nitrogen discharged into the river by closing wastewater treatment plants; improving other wastewater treatment plants; building pipelines necessary to reuse treated wastewater for irrigation of lawns, parks, and golf courses; eliminating failing septic tanks; and capturing and treating stormwater before it enters the river.

JEA is contributing $200 million toward the River Accord; the St. Johns River Water Management District up to $150 million; the city, $150 million; and the remaining $200 million is being sought from various federal and state sources. The River Accord has four major components: improving water quality, tracking the river's sedimentation, improving access, and program accountability (City of Jacksonville 2007h).

6.3.3 Relevant Future Actions

The River Accord. Restoring the water quality of the St. Johns River is the key component of The River Accord. The River Accord focuses on eliminating high levels of nitrogen that contribute to summer algal blooms occasionally experienced in the river and eliminating fecal coliform bacteria in the river tributaries, which is largely attributed to failing septic tanks. In partnership with the University of North

Florida Environmental Center, The River Accord proposes a program to daily track and analyze river sedimentation levels in real time and then to use these data to enforce existing regulations regarding siltation (City of Jacksonville 2007g).

Port of Jacksonville Deepening. As discussed in Section 6.1.2, the USACE Jacksonville District and JAXPORT are cooperating to study the feasibility of further deepening the Port of Jacksonville. A Supplemental EIS for the Jacksonville Harbor Navigation Study, General Re-Evaluation Report is being prepared to supplement the Jacksonville Harbor Navigation Improvements EIS completed in November 1998.

Potential Freshwater Withdrawal from the St. Johns River. SJRWMD estimates that 262 mg/d could be withdrawn from the St. Johns River and Ocklawaha River (a tributary to the St. Johns River) without causing environmental harm to the water resources or ecology. Utilities in central Florida are interested in pursuing these withdrawals to meet drinking water demands. The estimate of theoretically allowable withdraw from the St. Johns River from the headwaters to DeLand, Florida is 155 mg/d. This value represents the quantity estimated by the SJRWMD that could be withdrawn on a continuous basis without causing water levels or flows to fall below established minimum flows and levels (MFLs). The estimate for the lower Ocklawaha River is 107 mg/d. This estimate is based on an allocation study, but SJRWMD expects that this value will be refined based on establishment of MFLs, which is scheduled for 2009. Adopted MFLs limit both the quantity and timing of water withdrawals. According to the SJRWMD, the quantity of water available for withdrawal is a small portion of the river flow. The 155 mg/d MFLs for the St. Johns River from the headwaters to DeLand, Florida is about 7.8 percent of the average flow of the St. Johns River near DeLand and 2.9 percent of the average flow near Jacksonville. Timing restrictions consider lower flowing periods (SJRWMD 2008).

SJRWMD’s consumptive use permitting program regulates use of large amounts of water from the St. Johns River. When issuing a consumptive use permit, the SJRWMD limits the withdrawal of surface water to periods when it is available and protective of MFLs. Water supply withdrawal schedules proposed by an individual utility are tested for MFLs compliance considering not only the individual proposed withdrawal but also for all other permitted withdrawals. MFLs compliance must be demonstrated before a proposed withdrawal schedule is approved (SJRWMD 2008).

In developing MFLs for the St. Johns River, SJRWMD investigated potential downstream impacts of allowing surface water withdrawals from the river’s upper and middle basins, those areas between Sanford and Indian River County. The investigation concluded that a maximum cumulative withdrawal of 155 mg/d would not harm estuarine resources. Small increases in salinity in the river's lower basin (between Welaka and Mayport) would be expected as a result of surface water withdrawals, but are not expected to adversely impact plants and animals of the river or adversely impact dissolved oxygen concentrations in the river. SJRWMD is conducting additional detailed river flow models to further assess potential cumulative impacts and analyze a wide range of factors, including salinity changes that could result from water withdrawals and related impacts to the river water quality and habitat. The results of this work will be used in both setting new MFLs and updating current MFLs (SJRWMD 2008).

6.3.4 Cumulative Impacts Analysis

Cumulative surface water impacts resulting from increased impervious surfaces and disturbance associated with on-land construction would potentially have additive and interactive impacts with other actions affecting stormwater runoff at NAVSTA Mayport and other sources of stormwater runoff impacts to the St. Johns River. Each new construction activity involving new impervious surface would need to be evaluated to determine mitigation requirements to implement the December 2007 TMDL regulations. NAVSTA Mayport is currently attempting to reduce nutrient loading to the river by 63 percent and they are ensuring that all control measures relative to permitting noted in Sections 4.3 and 4.11, are implemented (Racine 2007b). These control measures would treat and remove nutrients in stormwater before it enters nearby receiving waters or prevent it from entering receiving waters to ensure no impact from the new impervious surface. The application of the December 2007 Lower St. Johns River TMDL regulations for activities throughout the area and the River Accord should have beneficial countervailing impacts on the river's water quality. Therefore, the resultant cumulative impact to surface water quality is not expected to be significant.

Although implementation of the Group 3 alternatives would minimally contribute to the construction footprint within the floodplain, the facilities would be elevated above the base flood level to minimize risk of flood loss and minimize the impact of floods on human safety, health, and welfare. Although the ecological function of the floodplain in the developed waterfront of NAVSTA Mayport has long since been modified by development, the cumulative impact would not be significant as the area affected is highly localized and remaining nearby floodplains, such as the marshlands in the western portion of NAVSTA Mayport, are not anticipated to be modified.

Past and ongoing dredging and disposal of maintenance dredged material have and will continue to have resulted in temporary increases in turbidity in dredged areas. Ongoing and future dredging projects at NAVSTA Mayport and in the Jacksonville region would have additive impacts when considered with

Group 2 and 3 proposed dredging. As assessed in Section 4.1 and 4.3, the deepening of the NAVSTA Mayport turning basin and entrance channel, and federal navigation channel (Jacksonville Harbor Bar Cut 3), would result in siltation rates similar to that which occur during the regular maintenance dredging of those areas. The initial round of maintenance dredging after the Navy's proposed dredging may involve a larger amount of material before stabilization of the area occurs. These periodic maintenance events, similar to the deepening project, will create short-term suspended sediment and turbidity in the vicinity of the dredging. The potential future deepening of the USACE Federal Navigation Project would generate short-term effects on water quality at the offshore disposal sites.

The dredge project proposed under Group 2 and 3 alternatives would have interactive impacts with the proposed Jacksonville Harbor deepening in terms of changes to hydrodynamics, currents, salinity, sedimentation, etc. These impacts will be evaluated in detail in USACE's Supplemental EIS for the Jacksonville Harbor Navigation Study, General Re-Evaluation Report. Although the specifics of impacts cannot be predicted at this time, the extent of the cumulative impacts within the proposed action would largely be localized in the area of confluence between proposed project dredge area within the NAVSTA Mayport entrance channel and federal navigation channel. Overall, the cumulative impact on water quality in the Lower St. Johns River would be localized and minor.

Freshwater withdrawals of the St. Johns River would also have the potential for cumulative impact with the dredging project proposed under the Group 2 and 3 alternatives and the Jacksonville Harbor deepening project, particularly with regard to salinity. The increase in salinity from the implementation of Group 2 or 3 alternatives just east of mile zero and upriver beyond mile seven (see Table 4.3-3) would be additive to other increases in salinity. The projected average increase in salinity as a result of the surface water withdrawals indicate the average 5-ppt isohaline would be shifted upstream by 0.8 mile at the 320-cubic feet per second withdrawal limit and the absolute change in mean salinity within the impacted area would be about 0.4 ppt (SJRWMD 2002). As noted in Section 6.3.3, the SJRWMD is further evaluating the impacts of these freshwater withdrawals, including cumulative impacts.

6.4 AIR QUALITY

6.4.1 Description of Geographic Study Area

The geographic study area for air quality is Duval County and Nassau County.

6.4.2 Relevant Past and Present Actions

Past and ongoing activities that generate air emissions from manmade (e.g., power plants, vehicle engines) and natural (e.g., forest fires) sources affect air quality. As noted in Section 3.4, Duval County and Nassau County are currently in attainment with all criteria pollutant standards.

6.4.3 Relevant Future Actions

Future development in the area will contribute to manmade air emissions. However, current air quality regulations ensure that air emissions from any new sources will be protective of human health.

6.4.4 Cumulative Impact Analysis

The emissions generated during the implementation of any of the action alternatives involving construction and/or dredging would be additive to other emissions generated coincidentally within the region. Compliance with the SIP will ensure that implementation of any of the action alternatives, in combination with past, present, and future actions, would not result in a new violation of existing NAAQS, nor contribute to an increase in the frequency or severity of violations of existing NAAQS, or delay the timely attainment of any NAAQS, interim milestones, or other milestones to achieve attainment.

6.5 NOISE

6.5.1 Description of Geographic Study Area

The geographic study area for cumulative noise impacts includes NAVSTA Mayport and the dredge area associated with Group 2 and 3 alternatives.

6.5.2 Relevant Past and Present Actions

The main sources of noise at NAVSTA Mayport are aircraft operations, including takeoffs, landings, touch-and-go operations, and engine maintenance run-ups. These noise sources impact land use on the Station as well as surrounding developed areas that are potentially incompatible with flight operations, such as residential developments, schools, and churches. Helicopters comprise the vast majority of the flight operations at NAVSTA Mayport; fixed-wing aircraft are transient.

Ongoing maintenance dredging in the dredge area has affected the noise environment in these areas.

6.5.3 Relevant Future Actions

The deepening of the Jacksonville Harbor, detailed in Section 6.1.2, would potentially involve blasting. The location of this blasting would be upriver from the location of the dredging proposed under the Group 2 and 3 alternatives. Furthermore, the timeframe for Jacksonville Harbor deepening action, although yet to be determined, would not likely occur coincident with the implementation of the Navy dredging project included in the Group 2 and 3 alternatives.

6.5.4 Cumulative Impact Analysis

The noise resulting from the construction activities associated with all alternatives except for Alternatives 2, 3, and 9 and dredging associated with all Group 2 and 3 alternatives would have minor additive impacts with the existing noise environment at NAVSTA Mayport, which is predominated by aircraft noise. Given the relatively small footprint of the average noise levels associated with air operations NAVSTA Mayport and the minor noise associated with implementation of the action alternatives, the resultant cumulative impact would not be significant. The Jacksonville Harbor deepening project would occur in a different time and place, and therefore would not have additive and/or interactive impact with the alternatives. Blasting is not expected as part of the Navy's proposed dredging operations.

6.6 BIOLOGICAL RESOURCES

6.6.1 Description of Geographic Study Area

The geographic study area for the biological resource cumulative impact analysis includes the NAVSTA Mayport turning basin, entrance channel, federal navigation channel within the St. Johns River, and the Atlantic Ocean extending out to Fernandina ODMDS and Jacksonville ODMDS.

6.6.2 Relevant Past and Present Actions

Relevant past and present actions include past and continued dredging projects in the Jacksonville Harbor and at NAVSTA Mayport and associated vessel trips to the USEPA-approved ODMDSs as well as Navy fleet training in the Jacksonville Range Complex (including those associated with AFAST and USWTR proposals) if fleet training operations are increased from current levels (see Section 6.2.2). As detailed in Section 6.1.2, past offshore disposal from Jacksonville Harbor dredging projects has been to the Jacksonville ODMDS and disposal in the Fernandina ODMDS has been from Submarine Base Kings Bay and Fernandina Harbor.

6.6.3 Relevant Future Actions

Relevant future actions include proposed USACE Jacksonville Harbor deepening (see Section 6.2.3), proposed JAXPORT cruise terminal (see Section 6.2.3), Dames Point Terminal development and increased containerized cargo throughput (see Section 6.8.3), and potential freshwater withdrawals of the St. Johns River (see Section 6.3.3).

6.6.4 Cumulative Impact Analysis

6.6.4.1 Marine Communities (Marine Flora, Invertebrates, Fish, and EFH)

Implementation of any Group 1 alternative would involve only minor terrestrial construction activities and there would be no new in-water construction or dredging activities. Therefore, there would be no impacts cumulatively to marine flora, invertebrates, and marine fish and no effects to EFH with implementation of any Group 1 alternative.

Implementation of any Groups 2 or 3 alternative, when considered cumulatively with the projects listed in Section 6.6.2 and 6.6.3, would have no significant cumulative effects on marine flora, invertebrates, fish, and EFH. A majority of the actions currently occur or are proposed to occur significantly upriver of NAVSTA Mayport and are neither dependent nor interdependent with the deepening project that is included with the Group 2 and 3 alternatives. Some of the projects (e.g., dredging of St. Johns River and Jacksonville Harbor) would likely have temporary direct and indirect cumulative impacts on marine flora and invertebrates primarily due to the suspension of sediments and short-term increases in turbidity within the water column in the nearshore environments of the proposed project locations and at the USEPA-approved ODMDSs. In addition, these projects would likely have temporary direct and indirect impacts on marine fish primarily due to the temporary displacement of fish species and their prey (e.g., marine fish and invertebrates) from suitable habitat within the vicinity of the project areas and ODMDSs. SJRWMD has concluded that the projected average increase in salinity as a result of the potential surface water withdrawals of the St. Johns River at a rate of 320-cubic feet per second may have a minor effect on the distribution of some aquatic species in the Lower St. Johns River. The 5-ppt isohaline may be shifted upstream by 0.8 mile. The absolute change in mean salinity within the impacted area is only about 0.4 ppt. This upstream translation of the saline water may impose stress or impacts to freshwater plant habitat in a 1,130-acre area. The species composition of the river, however, is not expected to change. It was concluded that this level of withdrawal would provide protection of the estuarine resources, but noted that this conclusion should be re-evaluated based on pending eel grass study results (SJRWMD 2002 and SJRWMD 2003). Further evaluations by SJRWMD are underway. Long-term, permanent impacts to populations of marine flora, invertebrates, fish or adverse effects to EFH; however, are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including implementation of any alternative in Groups 2 or 3. Therefore, no cumulative impacts to marine fish and EFH are foreseeable at this time.

6.6.4.2 Terrestrial Communities (Vegetation and Wildlife)

Implementation of any the 12 action alternatives or No Action Alternative would have no significant cumulative effects on terrestrial communities when considered in conjunction with the identified cumulative projects. The cumulative projects that include construction and renovation activities would occur in landscaped and previously disturbed areas and would remove landscaped vegetation and temporarily displace terrestrial wildlife (e.g., green anole, raccoon, gray squirrel, and migratory birds such as common ground dove, mourning dove, song sparrow, red-winged blackbird, house finch, northern mockingbird, and boat-tailed grackle). However, long-term, permanent impacts to terrestrial biological resources are not expected from implementing any alternative individually or in combination with other past, present, and reasonably foreseeable actions. Therefore, no cumulative impacts to terrestrial biological resources would occur.

6.6.4.3 Federally Threatened and Endangered Species

The main potential cumulative impact concerns the increase in marine vessel traffic within the St. Johns River and the nearby Atlantic Ocean and the associated potential increase in ship strikes to NRW. As detailed in Section 6.8.4.2, in the long-term, there would be an increase in total marine traffic primarily due to commercial/Harbor development, but the Navy's incremental contribution to the overall marine traffic under all alternatives would be insignificant. All alternatives would result in a net decrease in the number of ships homeported at NAVSTA Mayport and, therefore, a long-term decrease in the Navy vessel transit activities in the area. Therefore, there would be no cumulative impacts related to ship strikes and NRWs with implementation of any of the proposed NAVSTA Mayport homeporting alternatives and Navy vessel transit activities associated with NAVSTA Mayport. Navy vessel transit activities are addressed in the Navy's 1997 Regional BO with NMFS for Navy Activities off the Southeastern United States along the Atlantic Coast (NMFS 1997b) and the Navy is currently in consultation with NMFS for Navy vessel transit activities, to include all those associated with ships homeported at NAVSTA Mayport, under the East Coast Navy Tactical Training Theater Assessment Planning Program consultation. NRW Early Warning System would continue to minimize impacts to

NRW by ensuring the widest possible exchange and timely dissemination of sightings of NRW and other listed whale species (e.g., sperm whale, sei whale, etc.) to not only DoD, but also civilian shipping through coordination with the FWC, Georgia Department of Natural Resources, New England Aquarium Early Warning System, and others.

Under the Group 2 and 3 alternatives, the marine traffic associated with dredging and transits to the ODMDSs would result in short-term additive increases in marine traffic. The incremental impact would be minimized by the mitigation measures for potentially affected species protected by the ESA outlined in Section 4.6.5. In addition, ongoing dredging activities for the Navy, the Federal Navigation Project, and other users as described in Section 6.1.3 are expected to continue in the future resulting in additive short-term/transitory increases in vessel transits in the area. In particular, the possible deepening of the Jacksonville Harbor would increase the dredging activities beyond the historic maintenance dredging activities experienced in the past.

6.6.4.4 Marine Mammals

As discussed above in Section 6.6.4.3, some of the cumulative projects (e.g., dredging of St. Johns River and Jacksonville Harbor) would likely have temporary direct and indirect impacts on marine mammals primarily due to the temporary displacement of marine species and their prey (e.g., marine fish and invertebrates) from suitable habitat within the vicinity of the Group 2 and 3 project areas and associated USEPA-approved ODMDSs. In addition, the cumulative marine vessel movement (see Section 4.8.4) would have additive potential for impact to marine species with that associated with dredging and transport of dredged material to USEPA-approved ODMDSs. The protective measures for the Group 2 and 3 alternatives for vessels (e.g., NRW Early Warning System and a 24-hr/day lookout who has completed NMFS-approved marine mammal awareness training, use extreme caution and safe speed to avoid a collision with a marine mammal) during ODMDSs transit (see Section 4.6.5) would significantly reduce the potential incremental impact of marine traffic associated with these alternatives. No long-term, permanent impacts to populations of marine species, however, are expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including Group 2 or 3 alternatives. Therefore, no cumulative adverse effects to marine mammals would occur.

6.7 CULTURAL RESOURCES

6.7.1 Description of Geographic Study Area

The affected environment for cultural resources includes NAVSTA Mayport and the proposed dredge areas.

6.7.2 Relevant Past and Present Actions

Past use at NAVSTA Mayport described in Section 3.7 has influenced the cultural resources present within the study area. Present and continued development (as described in previous sections) within the Station could disturb unknown cultural resources.

6.7.3 Relevant Future Actions

Any development of NAVSTA Mayport, as described in Section 6.2.3, has potential to affect cultural resource sites known to occur at NAVSTA Mayport. However, existing management and planning tools including base master planning and the ICRMP, identify such sites, allowing for avoidance and proper resource management.

6.7.4 Cumulative Impact Analysis

Implementation of any of the alternatives, when considered in conjunction with other projects described in Section 6.7.3, would have no significant cumulative effects on cultural resources. Although there are six NRHP-eligible sites and a NRHP-listed structure at NAVSTA Mayport, current or future projects are not expected to disturb those historic properties as future projects would be coordinated with the SHPO per Section 106 of the NHPA. Whenever effects to historic properties could not be avoided, the effects would be addressed in accordance with the requirements of 36 CFR 800, in consultation with the SHPO, which would reduce effects to less than significant levels. Therefore, no cumulative impacts to cultural resources would occur.

6.8 TRAFFIC

6.8.1 Description of Geographic Study Area

The geographic study area for traffic and parking encompasses the entire developed portion of NAVSTA Mayport, as well as the local and regional areas and their ability to accommodate the additional traffic that would be generated by NAVSTA Mayport development, in combination with all other present and future projects on the Station or in the immediate community vicinity surrounding NAVSTA Mayport.

The geographic study area for marine vessel movement extends from the Jacksonville Harbor Bar Cut 3 federal navigation channel and up the St. Johns River approximately 21 miles to Tallyrand terminal and encompasses commercial, port facilities, military, and recreational marine vessel movements.

6.8.2 Relevant Past and Present Actions

City of Jacksonville Transportation Improvement Projects. Jacksonville Transportation Authority constructed the Wonderwood Connector, a four-lane, divided roadway from Hanna Park in the Village of Mayport to Monument Road in Arlington, which includes a new bridge over the Intracoastal Waterway. The first two phases were completed in 2005. The final segment of this project, connecting Monument Road with State Route 9A, is projected for mid-2008 (Jacksonville Transportation Authority 2005).

A flyover ramp was constructed from Atlantic Boulevard (State Route 10) to Mayport Road (State Route A1A) in order to relieve traffic congestion at this intersection caused by NAVSTA Mayport traffic. This project includes the flyover and additional turning lanes from eastbound on Atlantic Boulevard to northbound on Mayport Road and from southbound on Mayport Road to westbound on Atlantic Boulevard. This action reduced congestion in both directions on Atlantic Boulevard during morning and evening peak travel. This project interfaced with the recent widening of the Intracoastal Waterway Bridge on Atlantic Boulevard by the Florida Department of Transportation. It also included elevating and widening a portion of Atlantic Boulevard to provide more capacity as a hurricane evacuation route. Construction was completed in 2002. Daily traffic on Atlantic Boulevard in 2000 was 62,000 and Mayport Road 46,500 (Jacksonville Transportation Authority 2002). In 2005, traffic along Atlantic Boulevard was 50,500 (an 18.5 percent decrease) and Mayport Road 44,000 (a 5.4 percent decrease) (FCMPO 2007).

Jacksonville Harbor. For many years the Jacksonville Harbor has been used by commercial, military and recreational marine vessels. As noted in Section 3.8.4, there were more than 80,961 commercial vessel movements in Jacksonville Harbor in 2005 (USACE 2007).

New JAXPORT Cruise Terminal. See description at Section 6.2.3.

Navy Fleet Training in the Jacksonville Range Complex, USWTR, and AFAST. See descriptions at Section 6.2.3.

Recreational Boat Traffic. Few studies have been completed which provide a quantitative, comprehensive view of recreational boat activity in the study area; however, it is known that the area does support substantial marine traffic.

6.8.3 Relevant Future Actions

NAVSTA Mayport Non-Homeported Vessel Transits. As detailed in Table 4.8-4, U.S. Navy ships visiting NAVSTA Mayport and other visiting ships (e.g., foreign navy, special units, contractors) are expected to increase by approximately 20 percent between the 2006 baseline and 2014 end state. These marine vessel movements are tracked in terms of annual transits between the Sea Buoy (approximately 7 miles offshore) and the NAVSTA Mayport turning basin. The annual transits for U.S. Navy visiting ships would be approximately 100, comprising approximately 10 percent of the total annual NAVSTA Mayport vessel transits. Annual NAVSTA Mayport vessel transits by other visiting ships would increase to approximately 310, comprising approximately 31 percent of the total annual NAVSTA Mayport vessel transits. As presented in Table 3.8-6, the U.S. Coast Guard (a tenant at NAVSTA Mayport) comprises approximately 16 percent of the total vessel transits at NAVSTA Mayport and these transits could, dependent on mission changes, increase over time and are not reasonably foreseeable at this time.

St. Johns River Ferry Potential Closure. The St. Johns Ferry has provided service across the St. Johns River from the Village of Mayport to Fort Gorge Island for 58 years. Navy personnel commuting from the north to the Village of Mayport and Beaches residents who take the ferry to jobs in Amelia Island or Fernandina Beach comprise most of the riders. Tourists also use the boat to reach destinations such as the Kingsley Plantation or state parks on Big Talbot and Little Talbot islands. As noted in Section 3.8, ridership was 346,400 in 2005, down from 404,516 the previous year and 450,551 in 2003. The decline in use is partially attributed to the Wonderwood Expressway, which opened in 2004. Although there is a fee for ferry use (from $1 to $10 each way), operational costs were supplemented by the state and City of Jacksonville until this supplemental funding was cut in 2007. JAXPORT has committed to operating the ferry for the immediate future, but the long-term viability of the ferry through the 2014 end state is unknown. Closure of the St. Johns Ferry would result in traffic diverted west on State Routes 105 (Heckscher Drive) to 9A south then State Route 10 east to the Village of Mayport or the Wonderwood Connector from State Route 9A.

Dames Point Marine Terminal Development and Increased Containerized Cargo Throughput. As noted in Section 3.8, Dames Point Marine Terminal is one of three major JAXPORT terminals located on the St. Johns River. It includes a site that handles bulk or aggregate (sand, gravel, etc.), a cruise ship terminal (which began homeporting ships in 2004), and the TraPac Container Terminal that is under construction. In March 2007, JAXPORT issued a construction contract to build the terminal's “horizontal” port infrastructure, to include the container storage paving area, two 1,200 ft berths and associated dredging along the terminal’s waterfront. This 130 acre facility will be used by a Tokyo-based shipping line, Mitsui O.S.K. Lines, and its terminal operating partner, TraPac, to load and unload container ships sailing to and from ports in Asia. Mitsui O.S.K. Lines plans to move these containers on and off the terminal by truck. A second contract has become available for bid to complete the "vertical" construction at the site, to include terminal buildings, lighting, and related port equipment. The facility is scheduled to open for container ship service in late 2008 (JAXPORT 2007b). It is expected that the facility will increase marine vessel movements in the St. Johns River.

JAXPORT, the City of Jacksonville, and the South Korea-based ocean carrier, Hanjin Shipping Co. Ltd., signed a memorandum of understanding in October 2007 for the development of a new 170-acre container terminal facility at the Dames Point Terminal (see Figure 3.8-2) to begin operations in 2011 (JAXPORT 2007d). The terminal facility may be located at the site of the existing temporary JAXPORT cruise port facility or at a new plot of land. It could have the capacity to handle the equivalent of 1 million twenty-foot-equivalent units (TEUs), or 7.5 million tons of cargo, a year (Gibbons 2008). A TEU is an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals based on the volume of a 20-foot long shipping container. Vessels vary in capacity for TEUs, but there is a trend within the shipping industry towards vessels with 5,000-TEU and greater capacity.

In 2006, JAXPORT’s throughput of TEUs was 0.77 million (JAXPORT 2007a). Once both the new Mitsui O.S.K. Lines and Hanjin Shipping Co. Ltd. terminal facilities are operational, and additional services are provided at Blount Island to increase annual container throughput, it is estimated that throughput would increase to between 2.4 and 2.8 million TEUs (JAXPORT 2007d). One longer-term projection is that by 2020, the Dames Point and Blount Island Terminals together could accommodate an annual container throughput of 3.5 million TEUs. Under these projections, Jacksonville would be the third-largest container port on the entire Eastern Seaboard, with only New York/New Jersey and Virginia’s Hampton Roads handling more containerized cargo (JAXPORT 2007d).

New JAXPORT Cruise Terminal. See description at Section 6.2.3.

6.8.4 Cumulative Impacts Analysis

6.8.4.1 Traffic and Parking

There has been a 14.5 percent reduction in active personnel stationed at NAVSTA Mayport from a 1987 high of 18,726 personnel to the 2006 baseline population of 16,010 personnel. These changes in personnel to a base population lower than the historic high would reflect a decrease in traffic, both on- and off-Station. However, it is noted that off-Station, additional development and population influx since 1987 have affected traffic in the area, although the recent local roadway construction projects have helped to alleviate congestion. The recent City of Jacksonville Transportation projects noted in Section 6.9.2 have resulted in decreased travel delays and a consequential decline in congestion along local roadways. Daily traffic on Atlantic Boulevard in 2000 was 62,000 AADT count, and for Mayport Road 46,500 AADT. In 2005, traffic along Atlantic Boulevard was 50,500 AADT and Mayport Road 44,000 AADT, an 18.5 percent decrease and 5.4 percent decrease, respectively (FCMPO 2007).

Local efforts for new development around NAVSTA Mayport, detailed in Section 6.2.3, could contribute to increased traffic in the vicinity of NAVSTA Mayport. While condominium development would add to ADDT counts in the area; the establishment of a cruise terminal in the Village of Mayport could also result in periodic LOS impacts in the area associated with cruise ship arrivals and departures. The Mayport Community Redevelopment Area could have countervailing impacts in that it includes efforts to address traffic and congestion by promoting access management initiatives and a more pedestrian- and cyclist-friendly environment.

The potential closure of the St. Johns Ferry, which operates between the Village of Mayport (via State Route A1A) and Fort George Island, would result in traffic being diverted on State Route 105 (Heckscher Drive), State Route 9A, and Atlantic Boulevard to the Village of Mayport or the Wonderwood Drive Connector from State Route 9A.

Additional growth throughout the area, including Dames Point Terminal development, would have impacts on area traffic. The First Coast Metropolitan Planning Organization Long Range Transportation Plan proposes various improvements for highways and transit projects that, if implemented, would have countervailing impacts.

Establishment of a cruise terminal at Mayport would result in increased traffic primarily when passengers get off and on the ship, which normally occurs during non-peak traffic hours. JAXPORT will study road usage and, in partnership with the Florida Department of Transportation, make plans to address traffic impacts (JAXPORT 2008).

The cumulative effects which might result from the relevant past, present, and reasonably foreseeable future actions, both on the Station in any of the alternatives, or off Station as discussed above, do not appear to be collectively significant. Even under Alternative 12, which proposes to add the greatest working population to NAVSTA Mayport, there would be no significant impacts from NAVSTA Mayport development and local and regional development actions as foreseen at this time.

6.8.4.2 Marine Vessel Transit

The proposed dredging project included in the Group 2 and 3 alternatives would not affect general marine vessel movement in Jacksonville Harbor as the deepening does not extend beyond the NAVSTA Mayport entrance channel and would not support access to JAXPORT by deeper draft vessels. There is no interdependence between the dredge project associated with the Group 2 and 3 alternatives and other JAXPORT development. The cumulative effect of the other actions that are independent of the homeporting alternatives, however, would be expected to increase in the amount of marine traffic on the St. Johns River from commercial vessels, in particular. Increasing the depth of the shipping channel by the USACE would potentially increase the amount of commercial vessel traffic that calls on JAXPORT and other private ports. The increased depth would allow for larger ships to call on the port and accommodate existing ships that need a deeper water depth (draft) in order to call on the port fully loaded. This is cumulative with the increased marine vessel movements expected with the Mitsui O.S.K. Line and Hanjin Shipping Co. Ltd. container cargo ports development and operation. Cruise terminal operations should not affect normal river traffic. Although each cruise ship will need some time to turn as it arrives at the berth, this usually occurs in the early morning hours and normally takes no more than 10 minutes (JAXPORT 2008). Recreational boating would also be expected to continue its increasing trend independent of the homeporting of additional surface ships at NAVSTA Mayport.

Redevelopment of the Village of Mayport area may increase the amount of commercial and recreational vessel traffic in and out of the Village of Mayport, which may create more congestion around the NAVSTA Mayport entrance channel. In addition, widening the Trout River Cut Range and Quarantine Island Upper Range may increase recreational fishing and boating traffic on the St. Johns River. These projects may have cumulative impacts of causing congestion of marine traffic movement to a significant level if cargo berths are occupied and vessels waiting to call on the port are forced to wait in anchorage offshore.

The decrease in annual vessel transits between the Sea Buoy and the NAVSTA Mayport turning basin that would occur under all alternatives, estimated at a 9 percent decrease for Group 3 Alternative 12 (which involves the homeporting of the highest number of ships), would be offset by the expected increases in U.S. Navy, visiting ships, and U.S. Coast Guard transits associated with NAVSTA Mayport (tracked in terms of transits between the Sea Buoy and the turning basin). The incremental contribution of Navy traffic; however, to the overall marine traffic under all alternatives would be insignificant. In 2005, there were a total 80,961 vessel movements within the Jacksonville Harbor (including the St. Johns River Ferry) (USACE 2007). The 2006 baseline of all vessel transits at NAVSTA Mayport (1,170, see Table 3.8-6) are approximately 1 percent of this total vessel movements. Although there could be an increase in Navy marine vessel movement in the Jacksonville Range as part of Navy U.S. Fleet Forces Training, the impact of such increases on the study area cannot be foreseen at this time and are subject to the evaluation in the EIS for the Jacksonville Range Complex (see Section 6.2.3). The dredging associated with the Group 2 and 3 alternatives would result in a short-term and minimal increase in marine vessel movement.

An additional cumulative impact is that the deepening of the Harbor Bar Cut 3 of the federal navigation channel may provide incentive for JAXPORT to move forward with deepening the shipping channel since there would be less area to dredge, reducing the time and cost needed for the project. However, the Harbor Bar Cut 3 deepening associated with the Group 2 and 3 alternatives represents only a small portion of the 21-mile Jacksonville Harbor channel.

6.9 SOCIOECONOMICS

6.9.1 Description of Geographic Study Area

The geographic study area for the cumulative effects analysis for socioeconomics is the same as that described in Section 3.9, Duval County, City of Jacksonville, Atlantic Beach, Neptune Beach, Jacksonville Beach, and the census tracts surrounding the developed portions of NAVSTA Mayport.

6.9.2 Relevant Past and Present Actions

Past and present actions with potential socioeconomic cumulative impacts are the same as those described for land use in Section 6.2.2, with the additional consideration noted below.

KENNEDY Decommissioning. As stated in Section 1.3, the baseline year of 2006 used in this EIS is most representative of recent operations at NAVSTA Mayport because 2006 was the final full year of operations of the KENNEDY prior to its decommissioning in March 2007.

6.9.3 Relevant Future Actions

Relevant future actions with potential socioeconomic cumulative impacts are the same as those described for land use in Section 6.2.3, with the additional consideration noted below.

Potential Closure of the St. Johns Ferry. Restaurant owners near the ferry state that ferry passengers account for up to 40 percent of their business. Dozens of other businesses say they depend on the ferry to provide a steady customer base. The developer that is constructing the condominium and mixed-use development at the Village of Mayport has said that an end to ferry service would severely impact the project (Karkaria 2007 and Florida Times Union 2007b).

6.9.4 Cumulative Impact Analysis

The loss in net daily population associated with Group 1 and Group 2 alternatives and Alternative 4 of Group 3 would be offset by the economic growth in the area fueled by redevelopment. Because the baseline of 2006 includes the manning associated with the KENNEDY, some businesses are already affected by the losses associated with its decommissioning and the corresponding decrease in Navy personnel in the area. Loss in ferry service could have an additive negative impact on businesses in the area. With Alternative 12, there would be an additive and interactive gain with regard to the increase in net daily population and dependent population and associated businesses. Together with other revitalization initiatives, the combined cumulative impact would be greater economic gains in terms of employment, expenditures, and earnings in the local economy.

6.10 GENERAL SERVICES

6.10.1 Description of Geographic Study Area

The study area for general services includes the locations where service providers exist, such as schools, emergency services, law enforcement, health services, recreation, family services, and childcare. For the most part, these services are centered at NAVSTA Mayport, but provide service to off-Station military housing areas (Ribault Bay Village and Johnson Family Housing). Ribault Bay Village Housing is located approximately 1.5 miles south of the main gate, west of Mayport Road. Johnson Family Housing is located approximately 10 miles from NAVSTA Mayport, near the Atlantic Boulevard/9A interchange south of Craig Municipal Field. The focus is on government-provided services to the NAVSTA Mayport population, which includes the 2006 baseline of approximately 13,300 net daily population of the Station, plus an estimated 24,400 dependents of military personnel (adapted from DoN 2006a and NAVFAC 2005).

6.10.2 Relevant Past and Present Actions

The same actions described for land use have the potential for cumulative effect to general services. See Section 6.2.2.

6.10.3 Relevant Future Actions

The same actions described for land use have the potential for cumulative effect to general services. See Section 6.2.3.

Duval County Public Schools Redistricting. Duval County Public Schools is currently conducting community meetings to address their process for redistricting. Community input regarding status of facilities, school utilization, and school boundaries is being gathered for their Academic and Community Excellence Plan. They have divided the county into the four main planning areas of Central, North, Southeast, and Southwest, as well as eight smaller Concurrency Management Areas within those zones. NAVSTA Mayport is in the Southeast Planning Area, where issues to be addressed include whether or not underutilized schools is a bigger issue than overcrowded schools and if boundary adjustments are an acceptable means to ease overcrowding and balance enrollment. There are numerous federal and state rules, regulations, and policies that must be adhered to in this process. Working groups consisting of community leaders and citizens met in July – October 2008 and presented recommendations to the school board in November 2008. The School District's Long-Range Facilities Plan prioritizes projects to address underutilized schools, shifting demographics, declining enrollment, aging facilities, and excess capacity (Duval County School District 2008).

6.10.4 Cumulative Impact Analysis

Change in demand on general services, particularly schools, law enforcement and fire/emergency services, recreation, health services, childcare, and family services as a result of the homeporting alternatives would be compounded by growth and development of the community surrounding NAVSTA Mayport. It is not anticipated there would be adverse impacts, as the community would be prepared to meet the demands. As the community grows, general services would also be expanded as needed. Also, even with increases in population under Alternative 12, much of the demand for general services would be relatively dispersed throughout the community surrounding NAVSTA Mayport. Gains and losses of school age children associated with the alternatives could have interactive impacts with the Duval County Schools Redistricting process. Duval County School District consider factors such as shifts in demographics in planning for future construction and the Navy would provide demographic information to the school district so that they could account for such changes associated in school age population in combination with other changes in area demographics. As Group 3 alternatives would not be fully implemented until 2014 at the earliest, at least three years of advance planning could occur and, therefore, not impose significant cumulative impacts to general services.

The continued implementation of the MHPI at NAVSTA Mayport, particularly the bachelor housing component, would be expected to offset impacts of the homeporting alternatives. Future planning for housing requirements would be parallel with the decision-making process for this EIS so that housing requirements associated with homeporting of additional ships at NAVSTA Mayport are incorporated into plans for future military family and bachelor personnel.

6.11 UTILITIES

6.11.1 Description of Geographic Study Area

The geographic study area for utilities encompasses the entire developed portion of the NAVSTA Mayport and wherever improved parcels exist with utilities. It also includes the source locations and disposal or treatment sites of existing utility systems that may occur off Station.

6.11.2 Relevant Past and Present Actions

NAVSTA Mayport Development. See descriptions in Section 6.2.2.

6.11.3 Relevant Future Actions

Planned Development at NAVSTA Mayport and USWTR. See descriptions in Section 6.2.2.

6.11.4 Cumulative Impacts Analysis

Group 1 and 2 alternatives and Group 3 Alternatives 4 and 8 would result in a net decrease in ship loading and personnel loading at NAVSTA Mayport; resulting in an overall decrease in utilities requirements from the 2006 baseline. Group 3 Alternatives 10 and 12 would result in varying degrees of utilities needs compared to 2006 levels.

The construction of a 260-room bachelor enlisted quarters in FY 2005/2006 and the current construction of 78 new modules bachelor enlisted quarters are actions that increase loading on existing NAVSTA Mayport utility services. This recent increase in demand would contribute to the utility loading experienced during the period of development for the alternatives. Utilities impacted from bachelor enlisted quarters construction include sanitary sewer, electricity, stormwater, solid waste, and steam.

Planned development at NAVSTA Mayport that is relevant to the existing utilities loading includes an additional parking area and additions to the physical fitness center. These future actions would require the further creation of stormwater infrastructure, which would be in addition to the stormwater collection and diversion systems addressed in the alternatives involving construction (all alternatives except for Alternatives 2, 3, and 9). In addition, potential new mission activities (including possible homeporting of the LCS or DDG-1000) would require utilities upgrades. Cumulatively, it is anticipated that there would be no adverse impact to NAVSTA Mayport's or key offsite utility service providers' ability to supply the increased demand for utility services, given the relevant past, present, and future actions planned.

6.12 ENVIRONMENTAL HEALTH AND SAFETY

6.12.1 Description of Geographic Study Area

The geographic study area for environmental health and safety encompasses all of NAVSTA Mayport as well as the regional area and its ability to absorb the additional materials, substances, and waste that would be generated in combination with all the other past, present, and foreseeable future projects. In addition, consideration of the cumulative impact of the nuclear aspects of the project are discussed.

6.12.2 Relevant Past and Present Actions

NAVSTA Mayport Development. See description at Section 6.2.2. The existing NAVSTA Mayport security and AT/FP infrastructure limits NAVSTA Mayport access to only authorized personnel through the use of physical barriers and administrative practices and procedures (e.g., visual surveillance, issuing and checking identification cards and installation access documentation) thus reducing the risk of incidents.

6.12.3 Relevant Future Actions

Planned Development at NAVSTA Mayport. See description at Section 6.2.3.

6.12.4 Cumulative Impacts Analysis

The existing security measures at NAVSTA Mayport beneficially contribute to the health and safety environment that would exist with implementation any of the alternatives in a positive cumulative manner. Security and safety measures already in place will be continued or enhanced where/when possible during the course of implementation of the alternatives. With regard to redevelopment at NAVSTA Mayport, land use constraints are considered in future planning and LUCs associated with SWMUs are taken into account. In some areas, the disturbance of land in preparation for or during development could release contaminants to the environment or provide a conduit for subsurface contaminants to enter the groundwater or to contaminate surface waters. If the current practice of conducting investigations and cleanup efforts in accordance with relevant federal, state, local, and DoD regulations is continued, the potential for release or contamination of additional media will be minimized.

Cumulatively, it is anticipated that there would be no adverse impact to the region's ability to supply the increased demand for petroleum products or hazardous materials or to absorb disposal of wastes. As NAVSTA Mayport has historically supported operations and maintenance of Navy ships, there would not be significant introduction of new hazardous materials or toxic substances beyond those already present, with the exception of materials associated with the CVN.

Regarding the nuclear aspects of the project, nuclear-powered submarines are homeported in Kings Bay Naval Submarine Base, in southeastern Georgia, 35 to 40 miles north of Jacksonville. Since the CVN addressed in this EIS would establish the presence of a nuclear-powered aircraft carrier in the northern Florida area, the cumulative radiological impacts were analyzed. The analyses conservatively assume that all the nuclear-powered ships in the Kings Bay area were ported at NAVSTA Mayport along with the CVN. The analyses results show that the maximally exposed member of the public would receive less than 1 millirem of radiation exposure each year due to the presence of all nuclear powered vessels in the area. This exposure is so small that it is indistinguishable from naturally occurring background radiation.

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CHAPTER 7
SUMMARY OF PROPOSED MANAGEMENT ACTIONS AND MITIGATION MEASURES

This chapter summarizes the management actions and mitigation measures identified in Chapter 4 of this EIS. Mitigation and monitoring measures are expected to evolve and/or change as the NEPA process progresses and based on consultation with federal and state regulatory agencies (e.g., USACE, USEPA USFWS, and NMFS), public comment, and government-to-government consultation with federally recognized American Indian Tribes. The intent of this chapter is to provide a concise summary of the management actions and mitigation measures once they become more defined.

For the purposes of this EIS, management actions are those measures that are implemented by the Navy on an ongoing basis as part of best management practices, standard operating procedures, etc. Such management actions are considered in the impact analysis because they would provide for ongoing environmental protection. Mitigation, however, refers to additional action that would be taken to avoid, minimize, rectify, reduce/eliminate, or provide compensation for an impact that would result from an alternative. In 40 CFR 1500, CEQ defines mitigation as:

- *Avoidance*: Avoid the impact by changing the action. Do not take certain actions that would cause the environmental effect.
- *Minimization*: Minimize impacts by changing the intensity, timing, magnitude, or duration of the action and its implementation.
- *Rectifying*: Rehabilitate, repair, or restore damage that may be caused by implementing the proposed action.
- *Reducing/Eliminating*: Reduce or eliminate the impact over time.
- *Replacement*: Compensation for the impact by replacing the damage by improving the environment elsewhere or by providing other substitute resources such as funds to pay for the environmental impact.

The mitigation measures for the selected alternative will be identified in the Record of Decision. These measures will be funded, and efforts to ensure their successful completion or implementation are treated as compliance requirements.

7.1 SUMMARY OF UNAVOIDABLE ADVERSE IMPACTS

The construction of facilities under all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative would generate localized impacts to soils at previously disturbed sites and generate noise and air emissions. The impacts would be short term and use of standard management measures would minimize potential impacts. For the Group 2 and Group 3 alternatives, there would be unavoidable impacts related to dredging and offshore disposal including localized water quality, air quality, biological resources, noise, and coastal zone resources. These impacts are summarized below.

7.1.1 Earth Resources

- Short-term localized impacts to soils that would occur during land-based construction.
- Generation of approximately 5.2 million cy of dredged material for Group 2 and 3 alternatives.
- Under Group 2 and 3 alternatives, there would be long-term physical impact to substrate and benthos at dredged areas and at dredged material disposal sites.
- Under Group 2 and 3 alternatives, disposal of sediments would have physical impacts to sediment and benthos at offshore disposal sites.
- Under Group 2 and 3 alternatives, disposal of approximately 2 million cy of material (of the total 5.2 million cy of the proposed project) in the Jacksonville ODMDS would allow approximately 8 to 10 years of remaining capacity at that site based on USEPA and USACE projections.

7.1.2 Land and Offshore Use

- Under the Group 2 and 3 alternatives, there would be localized, short-term impacts of dredging on commercial and sports fishing.
- Under the Group 2 and 3 alternatives, coastal zone resources would be impacted on a short-term basis.

7.1.3 Water Resources

- Under all alternatives involving construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative), localized impacts to impervious surfaces and stormwater flow would occur at on-land construction sites.

- Under the Group 3 alternatives, the surficial aquifer could be encountered during the construction of the nuclear propulsion plant facilities.

- A minor amount of construction in the 100-year floodplain would occur under the Group 3 alternatives.

- Under the Group 2 and Group 3 alternatives, there would be short-term and localized impacts to water quality from suspended sediment during dredging and short term and localized impacts on water quality and biota from ODMDS disposal. During the active dredging and disposal actions, a portion of the chemical burdens of sediment would be released into the water column. Sediment sampling has found that most detected metals were below State Class III water quality standards. Although arsenic, mercury, and lead were found at relatively low levels, but in excess of Class III water quality standards in one elutriate sample collected for analysis in the DEIS. Follow-on more intensive, site specific MPRSA Section evaluations did not detect metals, PCBs, pesticides, or PAHs within the material to be dredged at levels exceeding Class III water quality standards

- There would be minor impacts to hydrodynamics (currents, salinity, sedimentation, etc.) of the St. Johns River and NAVSTA Mayport entrance channel and turning basin from the proposed dredging project.

7.1.4 Air Quality

- Under all alternatives that include construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative), there would be construction-related air emission increases.

- Emissions from construction under Group 2 and 3 alternatives (which include construction dredging) would include an approximate maximum of 199 tons of NO_x emitted in 2011 and 138 tons of NO_x emitted in 2012 primarily from construction dredging. The 2011 emissions represent approximately 0.26 percent of 2001 baseline emissions for Duval County.

- Under the Group 3 alternatives, there would be long-term minimal increases in operational emissions associated with the boilers for new nuclear propulsion plant maintenance facilities and increased mobile source emissions from increased net daily population under Alternatives 10 and 12, in particular.

7.1.5 Noise

- Noise would result from the construction activities and potentially affect sensitive noise receptors under all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative.

7.1.6 Biological Resources

- Under all alternatives that would involve construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative), there would be localized impacts to non-sensitive terrestrial communities from construction activities.
- Under the Group 2 and 3 alternatives, there would be short-term impacts to EFH and marine communities (marine flora and invertebrates) resources from dredging activities.
- Under the Group 2 and 3 alternatives, the Navy has determined that, with implementation of protective measures, implementation of the dredge project may affect, but is not likely to adversely affect NRW, humpback whales, or Florida manatee and would not destroy or adversely modify North Atlantic right whale or Florida manatee designated critical habitat. The Navy has found that, with implementation of protective measures, the use of a mechanical and/or cutterhead dredge may affect, but is not likely to adversely affect listed sea turtles; the use of a hopper dredge may adversely affect listed sea turtles; and bed-leveling activities in association with dredging operations may affect, but are not likely to adversely affect sea turtles.
- Potential impacts to marine mammals resulting from dredge activities under the Group 2 and 3 alternatives would be similar to those for special status species.

7.1.7 Cultural Resources

- There are no historic properties located within the project areas of potential effects.

7.1.8 Traffic

- Under all alternatives that would involve construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative) there would be localized, short-term on-Station impacts to traffic from construction of new facilities.
- Under the Group 3 alternatives, there would be localized, short-term on-Station impacts to traffic from implementation of traffic improvements.

- Under Alternative 12, there would be minor off-Station impacts to traffic from increased personnel.

- Under the Group 2 and Group 3 alternatives there would be an increase in marine vessel movements from dredging and dredged material disposal.

7.1.9 Socioeconomics

- Impacts to socioeconomics under any of the alternatives would not be considered adverse. Economic gains/losses are subjective and dependant on social factors. What is considered an adverse impact by some (loss in Navy jobs in the local area) may be viewed as a benefit by others (opportunity for other job sectors in the local area). Therefore, there is no action to offset these impacts under any of the alternatives.

7.1.10 General Services

- There would be impacts to Duval County School District from changes in enrollment levels for federally connected students associated with NAVSTA Mayport commensurate with the changes in school age children populations under all alternatives. Under all alternatives except for Group 3 Alternatives 10 and 12, there would be a decline in dependents and school age children associated with NAVSTA Mayport personnel losses. The Duval County School District addresses changes in demographics in long-range facilities and districting planning. The estimated 890 increase in school age children under Alternative 12 could result in overcrowding of schools.

- With the estimated gains of approximately 300 in dependent population under Alternative 10 and approximately 2,900 in dependent population under Alternative 12, there would be minor long-term increase in demand on fire and emergency services, recreational facilities and fields, family services, and childcare services.

7.1.11 Utilities

- Under Group 3 Alternatives, the area of potential development would require electrical, steam, compressed air, potable water, and stormwater upgrades to accommodate the demand for nuclear propulsion plant maintenance facility.

7.1.12 Environmental Health and Safety

- Potential risks to environmental health and safety introduced with construction activities under all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative.

7.2 MITIGATION MEASURES

7.2.1 Earth Resources

- Under Group 1 and Group 2 alternatives involving construction (all alternatives except for Alternatives 2, 3, and 9), mitigation of construction activities that would disturb less than one acre would include BMPs to control soil erosion and adherence to an Environmental Resource Permit for Stormwater Management Systems, if required (i.e., if combined impervious surface is greater than 9,000 sf) and associated erosion and sediment controls implemented.

- Under all Group 3 alternatives, mitigation for disturbance of 30 to 32 acres would be prescribed by the required Construction Generic Permit and Environmental Resource Permit for Stormwater Management Systems.

- Under all Group 2 and 3 alternatives, additional mitigation would potentially be identified with the modification of the NAVSTA Mayport SWPPP and MS4 management plans and goals.

- All alternatives would be subject to the December 2007 TMDL regulations, which require new impervious discharge to be evaluated and mitigation implemented to prevent additional nutrients from entering receiving waters.

- The Navy conducted chemical and biological testing in support of the dredging project that is part of the Group 2 and 3 alternatives per the MPRSA Section 103 permitting process as required by USACE and USEPA, who will verify the suitability for ocean disposal at a USEPA-managed ODMDS.

- Under all Group 2 and 3 alternatives, the Navy (as a member of the Jacksonville ODMDS SMMP Team), would continue to support the USACE Jacksonville District and USEPA Region 4 in determining appropriate disposal practices and potential management options at the Jacksonville ODMDS, including possible expansion of the Jacksonville ODMDS under MPRSA Section 102 if deemed necessary by USEPA Region 4.

7.2.2 Land and Offshore Use

There would be no significant impacts to land and natural resource management and use under any of the alternatives; therefore, no mitigation would be required for any alternative.

7.2.3 Water Resources

- Under all alternatives that would involve construction (all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative), the Navy would obtain required permits prior to construction, including an Environmental Resources Permit from FDEP, and implement appropriate BMPs to protect water resources from increased stormwater runoff associated with an increase in impervious surfaces.

- Under all Group 2 and 3 alternatives, the Navy would obtain required permits prior to dredging, including a CWA Section 401 State Water Certificate and an Environmental Resources Permit from FDEP, and a Rivers and Harbors Act Section 10 permit and a CWA Section 404 permit from USACE. The Navy would ensure that water quality standards would not be violated during dredging operations. In accordance with MPRSA Section 103 requirements, the Navy completed appropriate chemical and biological testing of dredged material during the permitting process as required by USACE and USEPA to verify the suitability for ocean disposal at an USEPA-managed ODMDS.

- Under all Group 3 alternatives, Massey Avenue road improvements would be designed to avoid wetlands. If the design cannot avoid impact to these wetlands, the impact would be mitigated in accordance with all applicable regulations.

- Under all Group 3 alternatives, nuclear propulsion facilities would be designed and constructed above the 100-year floodplain.

7.2.4 Air Quality

- Under all Group 2 and 3 alternatives, the use of modern dredging equipment with USEPA rated tier 1, tier 2 or tier 3 diesel engines to the greatest extent practicable would help minimize NO_x emissions.

- Under Group 3 Alternative 12, proactive practices to minimize the impact of increased mobile source emissions will be considered. In addition to encouraging car pooling, the use of hybrid vehicles, providing of mass transit for employees, and other alternative forms of transportation already in place (e.g., use of golf carts by ship repair contractors and several larger commands for routine transportation around the Station), NAVSTA Mayport will consider the conversion of the current base shuttle service to Low Emission Vehicles during re-competition of that contract scheduled for 2010 and replacement of NAVSTA Mayport's vehicle fleet with vehicles producing significantly fewer emissions than the current models, wherever practicable.

7.2.5 Noise

No mitigation measures are required because there are no significant or adverse impacts due to noise.

7.2.6 Biological Resources

- For all Group 2 and 3 alternatives, in accordance with section 7 of the ESA, the Navy and USACE, as co-consulter, have consulted with USFWS and NMFS regarding potential impacts to federally listed species and designated critical habitat. To support ESA consultation, BAs have been prepared to assess the potential impacts of Group 2 and 3 alternatives on ESA-listed species and designated critical habitat (Appendix B.3). The Navy and USACE anticipate similar terms and conditions to those identified in existing relevant BOs for similar dredging activities to be identified in the NMFS BO for the proposed action. Navy and USACE dredging activities currently comply with such terms and conditions. The Letter of Concurrence will be obtained from the USFWS and the BO from NMFS prior to the issuance of the Record of Decision for this FEIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision. The Navy will comply with federal and state regulations and permit requirements.

7.2.7 Cultural Resources

- No historic properties have been identified within the areas of potential effects for any alternatives. The Navy has consulted with the Florida SHPO to confirm that appropriate actions will be taken under each of the alternatives to ensure that historic properties will not be adversely affected in the course of this project undertaking.

- Under all alternatives that include construction, the Navy will attach a post-review discovery clause to the construction contract pursuant to 36 CFR 800.13 to ensure that cultural resources are taken into account in the unlikely event of their discovery. In addition, under the Group 3 alternatives, an archaeological monitor will be present during the Massey Avenue/Maine Street intersection improvement construction to ensure that NRHP-eligible prehistoric archaeological site (8DU7458) is avoided.

7.2.8 Traffic

No mitigation would be required for vehicle traffic or marine vessel movement under any of the alternatives.

7.2.9 Socioeconomics

No mitigation would be required for socioeconomics under any of the alternatives.

7.2.10 General Services

Under Alternative 12, the Navy would provide assistance to the Duval County School District, to the extent practicable, in their pursuit of FEIA to mitigate potential impacts to schools.

7.2.11 Utilities

No mitigation would be required for utilities under any of the alternatives.

7.2.12 Environmental Health and Safety

No mitigation would be required for environmental health and safety under any of the alternatives.

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CHAPTER 8
OTHER CONSIDERATIONS

8.1 CONSISTENCY WITH OTHER FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

8.1.1 Federal and State Plans, Policies, and Controls

A summary of the laws, implementing regulations, and executive orders applicable to the action alternatives is summarized herein. Table 8.1-1 lists the applicable federal and state environmental laws. In addition, a list of federal and state permits required for implementation of the Group 2 and 3 alternatives is provided in Table 8.1-2 or are otherwise discussed in Section 5.4. No permit requirements were identified in association with the Group 1 alternatives.

Table 8.1-1 Other Major Environmental Statutes, Regulations, and Executive Orders Applicable to Federal Projects

Environmental Resources	Statute, Regulation, or Executive Order
Geology, Topography, and Soils	• NPDES Construction Activity General Permit (40 CFR 122-124)
Wetlands and Floodplains	• Section 401 and 404 of the Federal Water Pollution Control Act of 1972 (PL 92-500) • USEPA, Subchapter D-Water Programs 40 CFR 100-149 (105 ref) • Floodplain Management-1977 (EO 11988) • Protection of Wetlands-1977 (EO 11990) • Emergency Wetlands Resources Act of 1986 (PL 99-645) • North American Wetlands Conservation Act of 1989 (PL 101-233)
Water Resources	• Federal Water Pollution Control Act of 1972 (PL 92-500) and Amendments • CWA of 1977 (PL 95-217) • NPDES Construction Activity General Permit (40 CFR 122-124) • NPDES Industrial Permit and NPDES MS4 Permit • CWA 40 CFR 112 Spill Prevention Control and Countermeasure • USEPA, Subchapter D-Water Programs (40 CFR 100-145) • Water Quality Act of 1987 (PL 100-4) • USEPA, Subchapter N-Effluent Guidelines and Standards (40 CFR 401-471) • Section 10 of the Rivers and Harbors Act of 1899 • Section 103 of MPRSA • The Florida Water Resources Act of 1972 (Florida Statute 373) • Florida Submerged Lands and Environmental Resource Program (FAC 18-21) • Outstanding Florida Waters (FAC 62-302.700) • Florida Generic NPDES Permits (FAC 62-621) • Florida Watershed Restoration Act of 1999 (Florida Statute 403.067) • Florida Surface Water Quality Standards (FAC 62-302 and 62-302.530) • Florida State Stormwater (FAC 62-25) • Warren S. Henderson Wetlands Protection Act of 1984 (Florida Statute 403.91-403.929)

Table 8.1-1 Other Major Environmental Statutes, Regulations, and Executive Orders Applicable to Federal Projects

Environmental Resources	Statute, Regulation, or Executive Order
Air Quality	• CAA of 1970 (PL 95-95), as amended in 1977 and 1990 (PL 91-604) • USEPA, Subchapter C-Air Programs (40 CFR 52-99) • 40 CFR Part 63 Subpart PPPPP, National Emissions Standards for Hazardous Air Pollutants • Florida Administrative Code Chapter 62-252, 62-210 and 62-296
Noise	• Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609) • USEPA, Subchapter G-Noise Abatement Programs (40 CFR 201-211) • City of Jacksonville Rule 4, Noise Pollution Control
Biological Resources	• Migratory Bird Treaty Act of 1918 • Fish and Wildlife Coordination Act of 1958 (PL 85-654) • Sikes Act of 1960 (PL 86-97) and Amendments of 1986 (PL 99-561) and 1997 (PL 105-85 Title XXIX); • ESA of 1973 (PL 93-205) and Amendments of 1988 (PL 100-478) • Fish and Wildlife Conservation Act of 1980 (PL 96-366) • Marine Mammal Protection Act and Amendments of 1994 (PL Public Law 103-238) • Lacey Act Amendments of 1981 (PL 97-79) • Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) • Responsibilities of Federal Agencies to Protect Migratory Birds (EO 13186) • Florida Endangered and Threatened Species Act of 1977 (Florida Statute 372.072) • Wildlife Code of the State of Florida (FAC 39) • Florida Environmental Land and Water Management Act of 1972 (Florida Statute 380.12 - 380.10) • Florida Land Conservation Act of 1972 (Florida Statute 259)
Cultural Resources	• NHPA (16 USC 470 et seq.) (PL 89-865) and Amendments of 1980 (PL 96-515) and 1992 (PL 102-575) • Protection and Enhancement of the Cultural Environment-1971 (EO 11593) • Indian Sacred Sites-1966 (EO 13007) • American Indian Religious Freedom Act of 1978 (PL 94-341) • Antiquities Act of 1906 • Archaeological Resources Protection Act of 1979 (PL 96-95) • Native American Graves Protection and Repatriation Act of 1990 (PL 101-601) • Protection of Historic Properties (36 CFR 800) • Abandoned Shipwreck Act (43 USC 2101) • Florida's Antiquities Law (Florida Statute Chapter 267 and FAC 1A-31 and 1A-32)
Hazardous and Toxic Substances and Waste	• RCRA of 1976 (PL 94-5800), as amended by PL 100-582; • USEPA, subchapter I-Solid Wastes (40 CFR 240-280) • CERCLA of 1980 (42 USC 9601) (PL 96-510) • Toxic Substances Control Act (TSCA) (PL 94-496) • USEPA, Subchapter R-Toxic Substances Control Act (40 CFR 702-799) • Federal Insecticide, Fungicide, and Rodenticide Control Act (40 CFR 162-180) • Emergency Planning and Community Right-to-Know Act (40 CFR 300-399) • Federal Compliance with Pollution Control Standards-1978 (EO 12088), Superfund Implementation (EO 12580) • Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423) • Florida Hazardous Waste Rule (FAC 62-730) • Florida Used Oil Management Rule (FAC 62-710); Mercury-Containing Lamps and Devices Management Rule (FAC 62-737)

Table 8.1-1 Other Major Environmental Statutes, Regulations, and Executive Orders Applicable to Federal Projects

Environmental Resources	Statute, Regulation, or Executive Order
Utilities	• Safe Drinking Water Act of 1972 (PL 95-923) and Amendments of 1986 (PL 99-339) • USEPA, National Drinking Water Regulations and Underground Injection Control Program (40 CFR 141-149)
Environmental Health and Safety	• Occupational Safety and Health Administration regulations (29 CFR) • Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898) • Protection of Children from Environmental Health Risks and Safety Risks (EO 13045)

Table 8.1-2 Required Permits for Group 2 and 3 Alternatives

Regulatory Requirement		Permitting Agency	Permit Specifications	Additional Information
CWA	Section 404	USACE	Regulates discharge of dredged or fill material into navigable waters	Permits for dredging activities often issued in conjunction with Section 401 of CWA and Section 10 of Rivers & Harbors Act
	Section 401	FDEP (Delegated authority from USEPA)	Regulates impacts of dredged material on water quality	Permits for dredging activities issued by FDEP in conjunction with above and Coastal Zone Consistency Determination
	NPDES Program	FDEP (delegated from USEPA)	CGP for Stormwater Discharge from Large and Small Construction Activities. Requirements include a Notice of Intent, a Notice of Termination and a construction site SWPPP.	Required for projects that disturb greater than one acre of soil, including lay-down, ingress and egress area. Phase I regulates construction activity disturbing 5 or more acres of total land area and Phase II regulates “small” construction activity disturbing between 1 and 5 acres of total land area.
Rivers and Harbors Act	Section 10	USACE	Regulates construction and/or dredging in navigable waters	Permits for dredging activities often issued in conjunction with Section 404 of CWA
Coastal Zone Management Act	Federal Consistency Provisions	FDEP (Delegated from federal CZMA)	Determination of consistency of federal actions with FCMP	Consistency determination is prepared and submitted by Navy seeking concurrence from FDEP
MPRSA	Section 103	USEPA in association with USACE	Regulates the dumping of dredged material in ocean waters	Permit requires full suite of physical, chemical and biological testing of sediment to determine suitability for ocean disposal at designated sites
Florida Submerged Lands and Environmental Resources Program		FDEP	Regulates activities that affect submerged lands and water quality resources	State issues an Environmental Resources Permit
Florida Surface Water Management Systems Program		St. Johns Water Management District	Regulates and controls the management of surface water	State issues an Environmental Resources Permit

NEPA and Navy Procedures for Implementing NEPA. This EIS has been prepared in compliance with NEPA and the Navy procedures for implementing NEPA. NEPA directs that "to the fullest extent possible…all agencies of the federal government shall…insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with the economic and technical considerations…" This document provides analysis of the impacts associated with 13 alternatives for homeporting ships at NAVSTA Mayport. The DEIS was distributed to appropriate federal, state, and local agencies, organizations, and interested persons. Comments from these agencies and the public have been incorporated into a FEIS. No action will take place until the FEIS has been filed with the USEPA and a Record of Decision has been signed by the Navy.

CWA and EO 11990, Protection of Wetlands, and EO 11988, Floodplain Management. The CWA, as amended, regulates discharges to the waters of the United States. Section 404 of the Act regulates the discharge of dredged or fill material. Permits for dredging activities are often issued in conjunction with Section 401 of CWA and Section 10 of the Rivers and Harbors Act. In compliance with the CWA and EO 11990, development in wetland areas have been avoided. No impacts to wetlands would occur with implementation of any of the alternatives. EO 11988 requires that federal agencies avoid activities that directly or indirectly result in development of floodplain areas. According to FEMA maps, portions of the potential construction associated with the Group 3 alternatives would lie within the 100-year floodplain; however, facilities would be constructed above the 100-year floodplain level.

Rivers and Harbors Act of 1899. Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States, unless the work has been authorized by the Secretary of the Army by a permit. Under the Group 2 and 3 alternatives, the Navy would apply for such a permit (see Table 8.1-2).

CAA. The CAA, as amended, provides for the protection and enhancement of the nation's air resources. The CAA requires USEPA review of this EIS. The document was provided to USEPA and FDEP to review for consistency with Section 309 of the CAA. The Group 2 and 3 alternatives would be in excess of *de minimis* thresholds for the ozone precursors VOCs and NO_X but would be well below the 10 percent of regional emissions significance threshold.

Fish and Wildlife Coordination Act. Section 10 of the Fish and Wildlife Coordination Act directs federal agencies to consult with USFWS, NMFS, and state agencies before authorizing alteration of water bodies. The purpose of this Act is to ensure that wildlife conservation receives equal consideration and coordination with other features of water resource programs. The Navy has coordinated this EIS with

USFWS, NMFS, USEPA, FDEP, USACE, and other state and federal agencies. These agencies were invited to comment and submit recommendations to the Navy on this document. The comments of these agencies were considered during preparation of the FEIS.

Magnuson-Stevens Fishery Conservation and Management Act. The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996, requires federal agencies to consult with NMFS on activities that may adversely affect EFH. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, or growth to maturity." HAPCs are a subset of EFH; Fishery Management Councils are encouraged to designate HAPCs under the Magnuson Act. The alternatives were evaluated for potential impact to EFH and were found to have no significant impact to these resources.

ESA. The ESA of 1973, as amended, requires that any action authorized by a federal agency shall not jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. Section 7 of the Act requires that the responsible federal agency consult with USFWS and NMFS concerning endangered and threatened species under their jurisdiction. In accordance with section 7 of the ESA, the Navy is in consultation with USFWS and NMFS regarding potential impacts to federally listed species and designated critical habitat. To support ESA consultation, the Navy and USACE, as co-consulter, have prepared BAs to assess the potential impacts of Group 2 and 3 alternatives on ESA-listed species and designated critical habitat. The BAs are provided in Appendix B.3. The Navy and USACE anticipate similar terms and conditions to those identified in existing and relevant BOs for similar dredging activities to be identified in the NMFS BO for the proposed action. Navy and USACE dredging activities currently comply with such terms and conditions. The Letter of Concurrence will be obtained from the USFWS and the BO from NMFS prior to issuance of the Record of Decision for this FEIS. The conditions of the USFWS Letter of Concurrence and terms and conditions of the NMFS BO will be identified in the Record of Decision.

Marine Mammal Protection Act. The Marine Mammal Protection Act establishes a national policy designated to protect and conserve marine mammals and their habitats. This policy is established so as not to diminish such species or population stocks beyond the point at which they cease to be a significant functioning element in the ecosystem, nor to diminish such species below their optimum sustainable population. Potential impacts to marine mammals (e.g., coastal bottlenose dolphin) resulting from dredge activities would be similar to those for species protected under the ESA. No injury or mortality of any marine mammal species is reasonably foreseeable and no adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed is expected. The USFWS and NMFS reviewed the DEIS and provided comments regarding marine mammal protection.

NHPA. The Navy has determined that no historic properties have been identified inside the project areas of potential effects. All proposed terrestrial development would occur on previously disturbed land. A remote sensing survey for potential underwater resources was conducted and found that no survey targets suggestive of cultural resources are located within the proposed dredging prism. Two underwater survey targets suggestive of cultural resources were identified within 100 feet of the existing federal navigation channel. While outside the proposed dredging area, the Navy consulted with the SHPO and conducted an underwater intensive-level survey of these targets designed to evaluate whether they qualify for inclusion in the NRHP. The Navy has consulted with the Florida SHPO under Section 106 of the National Historic Preservation Act to confirm that appropriate actions would be taken under each of the alternatives to ensure that historic properties will not be adversely affected in the course of this project undertaking (Appendix E.1).

MPRSA. The MPRSA establishes a framework for the control of dumping material in the territorial sea and seaward, and includes specific criteria and conditions for permissible dumping. Section 102 of the Act authorizes the USEPA to promulgate environmental criteria for evaluation of all dumping permit actions, to retain review authority over USACE Section 103 permit, and to designate ocean disposal sites for dredge material disposal. Section 103 of the Act specifies that all proposed operations involving the transportation and dumping of dredged material into ocean waters must be evaluated to determine potential environmental impacts of such activities. Under the authority of Section 103, the USACE may issue ocean dumping permits for dredged material if USEPA concurs with the decision. If USEPA does not agree with a USACE decision, a waiver process under Section 103 allows further action to be taken. The USEPA and USACE also may determine that ocean disposal is inappropriate because of ODMDS management restrictions or if options for beneficial use exist. Under the Group 2 and 3 alternatives, the Navy and USACE conducted appropriate chemical and biological testing as part of the Section 103 Evaluation. Additional testing of sediments was completed by USACE after publication of the DEIS that concluded that more than 4.8 million cy of the material to be dredged meets the USEPA Section 103 suitability criteria for ocean disposal. One sediment segment, representing approximately 315,000 cy, failed slightly the bioassay portion of the testing and is being re-tested. In the event this failed bioassay is confirmed with another failing test, this volume of dredged material would be placed at an existing permitted upland disposal site in the vicinity of NAVSTA Mayport. The Section 103 Evaluation will be finalized as part of the project permitting process. The remainder of the 5.2 million cy of material is suitable for ocean disposal. The Navy would obtain the Section 103 permit prior to initiating ocean disposal of dredged materials.

CZMA. The CZMA, as amended, provides for the effective management, beneficial use, protection, and development of the resources of the U.S. coastal zone. The FCMP identifies coastal zone boundaries, areas of critical state concern, spill prevention and control requirements, dredging and filling regulations, and a variety of other regulations. The Navy would ensure that the Naval activities directly affecting the coastal zone or resources of the coastal zone would be carried out in a manner that is, to the maximum extent practicable, consistent with the approved FCMP. FDEP reviewed the DEIS and determined it to be consistent with the FCMP and noted that continued concurrence would be based on adequate resolution of issues identified during subsequent regulatory review with final concurrence to occur during the environmental permitting stage.

8.1.2 Local Plans, Policies, and Controls

As noted in Section 4.2, the alternatives considered in this EIS would be consistent with the objectives of local land use plans, policies, and controls. Any of the alternatives would be consistent with the goals and objectives of the 15 elements of the City of Jacksonville's 2010 Plan. Historic Preservation, Housing, Transportation, Recreation and Open Space, Conservation/Coastal Management, Capital Improvements, Future Land Use, Infrastructure, and Intergovernmental Coordination are among the elements addressed in the plan (City of Jacksonville 2004/2005). The cumulative impact of induced growth that would occur under Alternatives 10 and Alternative 12 (in particular) could exacerbate the affordable housing goals and objectives of the housing element.

The Housing Element contains a set of policies aimed at developing "stable and definable neighborhoods which offer safe, sound, sanitary housing that is affordable to all its present and future residents." The purpose of the Housing Element is to quantify housing needs and develop policies to ensure that a varied supply of housing types exists in Jacksonville to meet the needs of residents in order to maintain a heterogeneous population capable of supporting a well-functioning community. As housing costs have risen (even with the recent downturn in housing), the single-family home has increasingly become out of reach of a larger proportion of the population. The cumulative effect of the influx of personnel and dependents in the NAVSTA Mayport area along with the decline in housing in that area (see Section 6.2.4) may affect the City's ability to meet these affordable housing goals and objectives (City of Jacksonville 2007h).

Additionally, policies relating to school siting in Duval County in the Intergovernmental Coordination Element would provide a means for consideration of overcrowding of schools in the NAVSTA Mayport area under Alternatives 10 and 12. These policies include the city coordinating with the Duval County Public School Board to ensure that population projections and proposed educational facility site plans and off-site impacts are consistent with the 2010 Comprehensive Plan and Land Development Regulation and periodically reviewing the existing interlocal agreements for County Services to Atlantic Beach, Neptune Beach, and Jacksonville Beach, and amending those agreements when it is mutually agreeable where such provision would be more efficient and economical than local provision (City of Jacksonville 2007h).

The Navy and City of Jacksonville have a long history of working together recently demonstrated by Ordinance 2006-1176, enacted in March 2007, which incorporated language into the Future Land Use Element and the Transportation Element by adding Objectives and Policies for recognizing, protecting and promoting the safe and productive function of military airports located in Jacksonville including NAVSTA Mayport. The text amendments acknowledge the City's commitment to long term viability of its military installations by outlining the features of its land development regulations in regard to land use, density, height limitations, lighting, disclosure, and noise attenuation as they may relate to installations. It designates a Military Influence Zone and identifies mitigation strategies to limit incompatible uses. A representative designated by the military serves as an ex officio member of the Local Planning Agency/Planning Commission, for comments or recommendations for lands that fall within the Military Influence Zones. The military designee is responsible for reviewing development plans for compatibility with the military mission in relation to all aspects of the proposed development. All proposed Comprehensive Plan Amendments, Planned Unit Developments, and Re-zonings which, if approved, would affect the density, intensity or use of land, that lie within Military Influence Zones are referred to the Navy for review prior to final action by the City (City of Jacksonville 2007h).

The alternatives would have less influence on the implementation of the goals and objectives of the City of Atlantic Beach's 2015 Plan. This plan similarly addresses land use, transportation, infrastructure, conservation and coastal management, recreation and open space, housing, intergovernmental coordination, and capital improvements elements. The alternatives would be consistent with this plan. Among other policies, affordable housing policies of this plan refer to supporting the efforts of the City of Jacksonville Housing Commission and pursuing interlocal agreements with the City of Jacksonville (City of Atlantic Beach 2004).

Finally, the alternatives would be consistent with the Northeast Florida Regional Planning Council's Strategic Regional Policy Plan for Northeast Florida. Although there would be similar impacts with regard to cumulative effects and affordable housing under Alternatives 10 and 12, all alternatives would be consistent with the economic development, emergency preparedness, natural resources of regional significance, and regional transportation elements of this plan (Northeast Florida Regional Planning Council 1997).

8.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

NEPA Section 101 (2.c(v)) requires a detailed statement on any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented. Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of those resources have on future generations. Irreversible commitments of resources are those that cannot be reversed except over an extremely long period of time. These irreversible effects primarily result from destruction of a specific resource (e.g. energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

Under all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative, there would be irreversible and irretrievable commitment for construction activities in the consumption of construction materials for project facilities and using fossil fuels for operations as well as the ongoing upkeep of the existing facilities. This would include the construction of the proposed DESRON headquarters building (Alternatives 1, 6, 7, 11, 8 and 10); PHIBRON headquarters (Alternative 5); and for Group 3 alternatives (Alternatives 4, 8, 10, and 12) construction of nuclear propulsion plant maintenance facilities, transportation improvements, and parking structures. Particular irreversible and/or irretrievable impacts that would result are noted below:

- Consumption of fossil fuels and energy would occur during construction and operation activities. Fossil fuels (gasoline and diesel oil) would be used to power construction equipment and vehicles. Electrical power would be used for lighting and operations. The energy consumed for project construction and operation represents a permanent and nonrenewable commitment of these resources.
- Permanent commitment of construction materials (concrete and steel, in particular) for construction of new facilities. These materials would be irretrievably committed for the

life of the project. Use of these materials represents a further depletion of natural resources. Construction and maintenance activities are considered a long-term nonrenewable investment of these resources.

- Land that would be physically altered by construction would be committed to the new use for the foreseeable future and would represent a permanent commitment of the land to a developed use and decrease the amount of open land available for other uses.
- The capital and labor required for construction would be an irreversible and irretrievable commitment of these resources.
- Existing requirement of public services and utilities associated with operation of NAVSTA Mayport would continue to be a long-term commitment of these resources. Most alternatives would decrease personnel loading and, therefore, reduce public service and utility demand, but personnel loading would increase with Alternatives 10 and 12.

In addition to the resources expended during the construction and operation of support facilities (described above) under the Group 2 and 3 alternatives, there would be consumptive use of certain nonrenewable energy resources required to operate dredge support systems, barges, tugs, trucks, pumps, and equipment. There would also be commitment of time and money to accomplish the disposal of dredged material. Time and money would be expended in the planning, testing, permitting, and implementation of dredge disposal. Dredged material disposed of offshore would be irreversibly and irretrievably committed to the disposal process. Disposal of sediment not suitable for ocean disposal at upland sites would not necessarily be irretrievably and irreversibly committed to such use, as the material could be reused for various purposes.

8.3 RELATIONSHIP BETWEEN SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

NEPA Section 101 (2.c(iv)) requires a detailed statement on the relationship between local short-term uses of man’s environment and the maintenance and enhancement of long-term productivity. Short-term uses of the environment associated with the alternatives include changes to the physical environment and energy and utility use during the construction of facilities associated with all alternatives except for Alternatives 2, 3, and 9 and the No Action Alternative and construction dredging under the Group 2 and Group 3 alternatives. Construction would involve short-term increases in fugitive emissions and construction-generated noise and would increase the use of fossil fuels to power equipment. In addition, expenditures of public funds and the use of labor would be required. Long-term changes would include the alterations to land use that would exist for the life of the new facilities and the alteration to the dredged depth of the NAVSTA Mayport turning basin and entrance channel and federal navigation channel that would remain as such subject to subsequent siltation and maintenance dredging. The act of offshore disposal of dredged material in USEPA-approved ODMDSs under Group 2 and 3 alternatives would be a short-term use of the environment that would affect the benthic environment of the area. Studies of benthic communities within and just outside the disposal sites (USEPA 1999a and USEPA 2006b) have shown that the composition of benthic species differs slightly with the changes in surficial substrata caused by disposal of dredging projects at the sites. The sandy bottom sites of the previously used Jacksonville and Fernandina ODMDSs have low productivity as compared to hard bottom or artificial reef ocean bottoms.

The homeporting of ships at NAVSTA Mayport would result in long-term productivity improvements in efficient utilization of existing assets at NAVSTA Mayport in support of the Navy mission. As noted in Section 1.2, the purpose of the proposed action is to ensure effective support of fleet operational requirements through efficient use of waterfront and shore side facilities at NAVSTA Mayport. Use of NAVSTA Mayport helps preserve distribution of homeport locations and ports to reduce the risks to fleet resources in the event of natural disaster, manmade calamity, or attack by foreign nations or terrorists. Full use of NAVSTA Mayport preserves the capabilities of the Jacksonville Fleet Concentration Area, which supports U.S. based naval surge capability. Finally, utilization of NAVSTA Mayport helps optimize fleet access to naval training ranges and operating areas by retaining ship homeport locations within six hours transit time of local operating areas.

CHAPTER 9
ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
°C	degrees Celsius
AADT	Average Annual Daily Traffic
AEC	Atomic Energy Commission
ACM	Asbestos Containing Material
ACRS	Advisory Commission on Reactor Safeguards
ADDAMS	Automated Dredging Disposal Alternatives Management System
AFAST	Atlantic Fleet Active Sonar Training
AGE	aerospace ground equipment
AICUZ	Air Installation Compatible Use Zone
AOC	Area of Concern
AOR	Area of Responsibility
APZ	Accident Potential Zones
APS	Air Particulate Sampler
ARG	Amphibious Ready Group
ASA	Applied Science Associates, Inc.
AST	Above Ground Storage Tank
AT/FP	Anti-Terrorism/Force Protection
ATG	Afloat Training Group
ATR	Automatic Traffic Recording
BA	Biological Assessment
BMP	Best Management Practice
BO	Biological Opinion
BRAC	Base Realignment and Closure
BUMED	Bureau of Medicine & Surgery
CAA	Clean Air Act
CAAA	Clean Air Act and Amendments
CERCLA	Comprehensive Environmental Response Compensation & Liability Act
CEQ	Council for Environmental Quality
CFR	Code of Federal Regulations
cfs	cubic feet per second
CG	cruiser
CGP	Construction Generic Permit
CIF	Controlled Industrial Facility
CLASSRON	class squadron
CMS	Corrective Measure Study
CNIC	Commander Navy Installations Command
CNO	Chief of Naval Operations
CNRSE	Commander Navy Region Southeast
CO	carbon monoxide
COMUSNAVSO	Commander U.S. Naval Forces Southern Command
COMFOURTHFLT	Commander U.S. Fourth Fleet
CRU/DES	cruiser/destroyer/frigate
CV	conventional aircraft carrier
CVN	nuclear-powered aircraft carrier
CWA	Clean Water Act
cy	cubic yard
CZMA	Coastal Zone Management Act
DAMOS	Disposal Area Monitoring System
DARM	Division of Air Resource Management
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DDG	destroyer
DDT	Dichloro-Diphenyl-Trichloroethane
DEIS	Draft Environmental Impact Statement
DESRON	destroyer squadron
DFM	Diesel Fuel Marine
DMMP	Dredged Material Management Plan
DO	dissolved oxygen
DoD	Department of Defense
DOE	Department of Energy
DoN	Department of the Navy
DOT	Department of Transportation
DRMS	Defense Reutilization and Marking Service
DWTP	Domestic Wastewater Treatment Plant
EFDC	Environmental Fluid Dynamic Code
EFH	Essential Fish Habitat
e.g.	for example
EIS	Environmental Impact Statement
EO	Executive Order
EPCRA	Emergency Planning and Community Right-To-Know Act
ERAP	Emergency Response Action Plan
ERL	Effects Range Low
ERM	Effects Range Median
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
FAC	Florida Administrative Code
FCA	Fleet Concentration Area
FCMPO	First Coast Metropolitan Planning Office
FDEP	Florida Dept. of Environmental Protection
FDOT	Florida Department of Transportation
FEIA	Federal Education Impact Aid
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFG	frigate
FMC	Fishery Management Council
FMU	Fishery Management Unit
FNAI	Florida Natural Areas Inventory
FRP	Fleet Response Plan
FRS	Fleet Replacement Squadron
ft	feet/foot
ft/s	feet per second
FTA	Federal Transit Administration
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute
FY	Fiscal Year

GAO	Government Accountability Office
GPD	gallons per day
GPM	gallons per minute
HAP	Hazardous Air Pollutant
HAPC	Habitat Area of Particular Concern
HARP	Historic & Archeological Resources Protection Plan
HCM	Highway Capacity Manual
HEPA	High Efficiency Particulate Air
HMS	Highly Migratory Species
HP	horsepower
HSWA	Hazardous and Solid Waste Amendments
HWSF	Hazardous Waste Storage Facility
Hz	hertz
i.e.	that is
INRMP	Integrated Natural Resource Management Plan
IRP	Installation Restoration Program
ISIC	Immediate Superior in Command
ITE	Institute of Transportation Engineers
JAXPORT	Jacksonville Port Authority
JEA	Jacksonville Electric Authority
JEPB	Jacksonville Environmental Protection Board
JOSFC	Jacksonville Offshore Sports Fishing Club
JP-5	jet petroleum
kg/y	kilograms per year
kV	kilovolts
kVA	kilovolt-amps
LAMPS	Light Airborne Multi-Purpose System
lb/hr	pounds per hour
LBP	Lead Based Paint
LCS	littoral combat ship
LEED	Leadership in Energy and Environmental Design
LFC	Latent Fatal Cancer
LHD	amphibious assault ship
LID	Low Impact Development
LOS	Levels of Service
LPD	amphibious transport dock ship
LSD	dock landing ship
LUC	Land Use Control
MAFMC	Mid-Atlantic Fisheries Management Council
MCSF-BI	U.S. Marine Corps Support Facility Blount Island
MDFATE	Multiple Dump Fate model
MFL	minimum flow and levels
mg/d	million gallons per day
mg/l	milligrams per liter
MHPI	Military Housing Privatization Initiative
MILCON	Military Construction
MILHDBK	Military Handbook
MLLW	Mean Lower Low Water
MPRSA	Marine Protection, Research, and Sanctuaries Act
MS4	Municipal Separate Storm Sewer Systems
MSDS	Material Safety Data Sheet
MSF	Maintenance Support Facility
MSGP	Multi-Sector General Permit
msl	mean sea level
MVA	Megavolts-Ampere
MWh	megawatt-hours
MWR	Morale, Welfare, and Recreation
NAAF	Naval Auxiliary Air Facility
NAAQS	National Ambient Air Quality Standards
NAS	Naval Air Station
NAVFAC	Naval Facilities Engineering Command
NAVOSH	Navy Safety and Occupational Health Program
NAVSTA	Naval Station
NCRPM	National Council on Radiation Protection and Measurements
NEPA	National Environmental Policy Act
ng/l	nanogram per liter
NH_3	ammonia
NHPA	National Historic Preservation Act
nm	nautical miles
NMFS	National Marine Fisheries Service
NNPP	Naval Nuclear Propulsion Program
NO_2	nitrogen dioxide
NO_2+NO_3	nitrate-nitrite nitrogen
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRHP	National Register for Historic Places
NRW	North Atlantic Right Whale
NTUs	nephelometric turbidity units
O_3	Ozone
ODMDS	Ocean Dredged Material Disposal Site
OEIS	Overseas Environmental Impact Statement
OFW	Outstanding Florida Water
OPNAVINST	Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Administration
OWTP	Oily Wastewater Treatment Plant
OWWO	Oily Waste-Waste Oil
PAH	polycyclic aromatic hydrocarbons
PA	Preliminary Assessment
Pb	lead
PCB	Polychlorinated Biphenyls
PHIBRON	Amphibious Squadron
PL	Public Law
PM	particulate matter
$PM_{2.5}$	particulate matter smaller than 2.5 microns in diameter
PM_{10}	particulate matter with a diameter of 10 microns or less

POL	Petroleum, Oil, and Lubricant
POV	Privately Owned Vehicle
PPV	Public Private Venture
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
PSD	Prevention of Significant Deterioration
psi	pounds per square inch
QDR	Quadrennial Defense Review
RCRA	Resource Conservation and Recovery Act
RFA	RCRA Facility Assessment
RFI	RCRA Facility Investigation
ROI	Region of Influence
RV	Recreational Vehicle
SAFMC	South Atlantic Fishery Management Council
SAIC	Science Applications International Corporation
SAV	Submerged Aquatic Vegetation
scfm	standard cubic feet per minute
SERMC	Southeast Regional Maintenance Center
sf	square foot/feet
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SI	Site Inspection
SJRWMD	St. Johns River Water Management District
SMF	Ship Maintenance Facility
SMMP	Site Management and Monitoring Plan
SO_2	sulfur dioxide
SO_x	oxides of sulfur
SOC	Species of Concern
SOUTHCOM	Southern Command
SQG	Sediment Quality Guidelines
SR	State Route
SRA	Selected Restricted Availability
SSFATE	Suspended Sediment Fate Model
STFATE	Short Term Fate Model
SVOC	semivolatile organic compound
SWMP	Stormwater Water Management Plan
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
TAP	Tactical Training Theater Assessment Planning Program
TBP	Theoretical Bioaccumulation Potential
TEU	Twenty-foot Equivalent Unit
TKN	total kjeldahl nitrogen
TMC	Turning Movement Count
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
THREATCON	Threat Condition
TSC	Theatre Security Cooperation
TSCA	Toxic Substances Control Act
TYCOM	Type Commander
µg/l	microgram per liter
$\mu g/m^3$	micrograms per cubic meter
U.S.	United States
USC	United States Code
UFC	Unified Facilities Criteria
UHM	Used Hazardous Material
USACE	U.S. Army Corps of Engineers
USBEA	U.S. Bureau of Economic Analysis
USEPA	U.S. Environmental Protection Agency
USFDA	U.S. Food and Drug Administration
USFF	U.S. Fleet Forces Command
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
USWTR	Navy Undersea Warfare Training Range
VOC	volatile organic compound

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CHAPTER 10
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CHAPTER 11
LIST OF PREPARERS

This EIS was prepared for the U.S. Fleet Forces Command by TEC Inc. under contract to Naval Facilities Engineering Command, Southeast. The Navy's Engineer-in-Charge for its preparation is:

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Department of the Navy
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Jacksonville, FL 32212-0030

A list of primary technical analysts contributing to the preparation of the EIS is provided below. In addition, the USACE and USEPA served as cooperating agencies, providing input and review of the EIS during its development. Cooperating agency letters identifying roles and responsibilities are included following this list of technical analysts.

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B.S. Chemistry
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DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

5090
Ser N773/**636**
13 Mar 07

COL Paul L. Grosskruger
U.S. Army Corps of Engineers
Jacksonville District
701 San Marcos Boulevard
Jacksonville, FL 32207-0019

Dear Colonel Grosskruger:

In accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) implementing regulations 40 Code of Federal Regulations (CFR) 1500-1508, and the Chief of Naval Operations Instruction 5090.1B, the Navy has initiated an Environmental Impact Statement (EIS) to study the environmental effects of homeporting surface ships at Naval Station (NAVSTA) Mayport, Florida. In order to adequately evaluate the potential environmental effects of the proposed action, the Navy and the U.S. Army Corps of Engineers (USACOE) will need to work together on effects associated with the action alternatives. In accordance with 40 CFR Section 1501.6 and the CEQ Cooperating Agency guidance issued on 30 January 2002, the Navy requests USACOE serve as a cooperating agency for the development of this EIS.

The Department of the Navy proposes to homeport additional surface ships at NAVSTA Mayport. This proposal includes homeporting various types of surface ships; and assigning operational staff, dependents, and other personnel to NAVSTA Mayport. The EIS will review and assess 13 alternatives for various types of ships, including: cruisers, destroyers, frigates, amphibious assault ships, amphibious transport dock ships, dock landing ships, a nuclear-powered aircraft carrier, transient carrier capability, and combinations of these ship types. Several of the alternatives being considered could involve a considerable amount of new work dredging.

The purpose of the proposed action is to ensure effective support of Fleet operational requirements through efficient utilization of waterfront and shoreside facilities at NAVSTA Mayport. The Navy needs to take advantage of opportunities to maintain and, where possible, improve its ability to support U.S. Fleet Forces Command (USFFC) operational and training requirements without significant increase in its operational costs. Additionally, the Navy needs to utilize available facilities, both pierside and shoreside, at NAVSTA Mayport in an efficient and well organized manner, while minimizing new construction.

The EIS will address the environmental impacts of the proposed action associated with homeporting various ship types. The EIS will

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address any potential environmental impacts to resources including water resources, air quality, biological resources, threatened and endangered species, land use, socioeconomic resources, infrastructure, and cultural resources. The analyses will include direct and indirect impacts, and will account for cumulative impacts from other past, present and reasonably foreseeable future actions.

Your agency's special expertise is needed to ensure adequate evaluation of the potential environmental effects from the actions of dredging and dredge material disposal. It is Navy's desire to formalize the USACOE role as a cooperating agency, as outlined in the CEQ guidelines (40 CFR Part 1501.6).

As the lead agency, the Navy will be responsible for overseeing preparation of the EIS that includes, but is not limited to, the following:

a. Gathering all necessary background information and preparing the EIS.

b. Determining the scope of the EIS, including the alternatives evaluated.

c. Working with appropriate USACOE personnel to evaluate potential impacts of the actions on the area to be dredged as well as the offshore dredge material disposal site.

d. Circulating the appropriate NEPA documentation to the general public and any other interested parties.

e. Scheduling and supervising public meetings held in support of the NEPA process. This shall include without limitation, compiling and responding to comments received at these meetings.

f. Maintaining an administrative record and responding to any Freedom of Information Act requests relating to the EIS.

As the cooperating agency, the Navy requests USACOE support the Navy in the following manner:

a. Providing timely comments on working drafts of the EIS documents. The Navy requests that comments on draft EIS documents be provided within 21 calendar days.

b. Responding to Navy requests for information. Timely input will be critical to ensure a successful NEPA process.

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c. Participating, as appropriate, in public meetings hosted by the Navy for receipt of public comment on the NEPA document and environmental analysis.

d. Scheduling meetings requested by Navy in a timely manner.

e. Adhering to the overall schedule as set forth by the Navy.

f. Providing a written response to this request, including designation of command and contact for the cooperating agency role, as appropriate.

g. Provide expertise in the area of dredging, particularly in the areas of material characterization, disposal methods and locations, and cost estimation.

The Navy views this agreement as important to the successful completion of the NEPA process for the Mayport Homeporting EIS. It is the Navy's goal to complete the analysis as expeditiously as possible, while using the best scientific information available. The assistance of the USACOE will be invaluable in that endeavor.

USFFC POC is Mr. Mark Dussia, N773, (757) 836-3693 or E-Mail: mark.dussia@navy.mil.

Sincerely,

M.R. Harrell

M. R. HARRELL
Assistant Deputy Chief of Staff
for Operational Readiness
and Training
By direction

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DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

APR 16 2007

Programs and Project Management Division
Interagency and International Services Branch

Mr. M.R. Harrell
Assistant Deputy Chief of Staff
for Operational Readiness and Training
U.S. Fleet Forces Command
1562 Mitcher Ave. STE 250
Norfolk, Virginia 23551-2487

Dear Mr. Harrell:

This is in regard to your letter of March 13, 2007, concerning the U.S. Army Corps of Engineers (USACE) serving as a cooperating agency for the development of an Environmental Impact Statement (EIS) to study the environmental effects of homeporting surface ships at Naval Station (NAVSTA) Mayport, Florida.

The Jacksonville District of the USACE recognizes the importance of this EIS to the Department of Navy and national defense and agrees to serve as a cooperating agency subject to the availability of resources.

The items Navy is requesting USACE to support as a cooperating agency may involve tasks that require more extensive technical resources beyond the scope normally provided by USACE Regulatory permitting functions. This type of support and any other major activities or analyses would require funding from the Navy.

The Jacksonville District, USACE point of contact for the cooperating agency role is Mr. Randy Turner, telephone 904-232-1671 or e-mail randy.l.turner@saj02.usace.army.mil. His mailing address is as follows:

U.S. Army Corps of Engineers
Jacksonville District
Attn: CESAJ-DP-S (Mr. Randy Turner)
701 San Marco Boulevard
Jacksonville, Florida 32207

Sincerely,

Paul L. Grosskruger
Colonel, U.S. Army
District Commander

DEPARTMENT OF THE NAVY
COMMANDER
U.S. FLEET FORCES COMMAND
1562 MITSCHER AVENUE SUITE 250
NORFOLK, VA 23551-2487

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Ser N773/**635**
13 Mar 07

Mr. Heinz Mueller
Chief, U.S. Environmental Protection Agency
Sam Nunn Atlanta Federal Center, NEPA Office
61 Forsyth Street, S.W.
Atlanta, GA 30303-8960

Dear Mr. Mueller:

In accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality's (CEQ) implementing 40 Code of Federal Regulations (CFR) 1500-1508, and the Chief of Naval Operations Instruction 5090.1B, the Navy has initiated an Environmental Impact Statement (EIS) to study the environmental effects of homeporting surface ships at Naval Station (NAVSTA) Mayport, Florida. In order to adequately evaluate the potential environmental effects of the proposed action, the Navy and the Environmental Protection Agency (EPA) will need to work together on effects associated with the action alternatives. In accordance with 40 CFR Section 1501.6 and the CEQ Cooperating Agency guidance issued on 30 January 2002, the Navy requests EPA serve as a cooperating agency for the development of this EIS.

The Department of the Navy proposes to homeport additional surface ships at NAVSTA Mayport. This proposal includes: homeporting various types of surface ships; and assigning operational staff, dependents, and other personnel to NAVSTA Mayport. The EIS will review and assess 13 alternatives for various types of ships, including: cruisers, destroyers, frigates, amphibious assault ships, amphibious transport dock ships, dock landing ships, a nuclear-powered aircraft carrier, transient carrier capability, and combinations of these ship types. Several of the alternatives being considered could involve a considerable amount of new work dredging.

The purpose of the proposed action is to ensure effective support of Fleet operational requirements through efficient utilization of waterfront and shoreside facilities at NAVSTA Mayport. The Navy needs to take advantage of opportunities to maintain and, where possible, improve its ability to support U.S. Fleet Forces Command (USFFC) operational and training requirements without significant increase in its operational costs. Additionally, the Navy needs to utilize available facilities, both pierside and shoreside, at NAVSTA Mayport, in an efficient and well organized manner, while minimizing new construction.

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The EIS will address the environmental impacts of the proposed action associated with homeporting various ship types. The EIS will address any potential environmental impacts to resources including water resources, air quality, biological resources, threatened and endangered species, land use, socioeconomic resources, infrastructure, and cultural resources. The analyses will include direct and indirect impacts, and will account for cumulative impacts from other past, present and reasonably foreseeable future actions.

Your agency's special expertise is needed to ensure adequate evaluation of the potential environmental effects from the actions of dredging and dredge material disposal. It is Navy's desire to formalize the EPA role as a cooperating agency, as outlined in the CEQ guidelines (40 CFR Part 1501.6).

As the lead agency, the Navy will be responsible for overseeing preparation of the EIS that includes, but is not limited to, the following:

a. Gathering all necessary background information and preparing the EIS.

b. Determining the scope of the EIS, including the alternatives evaluated.

c. Working with appropriate EPA personnel to evaluate potential impacts of the actions on the area to be dredged as well as the offshore dredge material disposal site.

d. Circulating the appropriate NEPA documentation to the general public and any other interested parties.

e. Scheduling and supervising public meetings held in support of the NEPA process. This shall include without limitation, compiling and responding to comments received at these meetings.

f. Maintaining an administrative record and responding to any Freedom ot Information Act requests relating to the EIS.

As the cooperating agency, the Navy requests EPA support the Navy in the following manner:

a. Providing timely comments on working drafts of the EIS documents. The Navy requests that comments on draft EIS documents be provided within 21 calendar days.

b. Responding to Navy requests for information. Timely input will be critical to ensure a successful NEPA process.

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c. Participating, as appropriate, in public meetings hosted by the Navy for receipt of public comment on the NEPA document and environmental analysis.

d. Scheduling meetings requested by Navy in a timely manner.

e. Adhering to the overall schedule as set forth by the Navy.

f. Providing a written response to this request, including designation of command and contact for the cooperating agency role, as appropriate.

The Navy views this agreement as important to the successful completion of the NEPA process for the Mayport Homeporting EIS. It is the Navy's goal to complete the analysis as expeditiously as possible, while using the best scientific information available. The assistance of the EPA will be invaluable in that endeavor.

USFFC POC is Mr. Mark Dussia, N773, (757) 836-3693, or E-Mail: mark.dussia@navy.mil.

Sincerely,

M.R. Harrell

M. R. HARRELL
Assistant Deputy Chief of Staff
for Operational Readiness
and Training
By direction

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

May 15, 2007

Mr. M.R. Harrell
Assistant Deputy Chief of Staff for Operational
Readiness and Training
U.S. Department of the Navy
U.S. Fleet Forces Command
1562 Mitscher Avenue, Suite 250
Norfolk, VA 23551-2487

SUBJECT: Cooperating Agency Request for the Environmental Impact Statement for Homeporting of Additional Surface Ships at Naval Station Mayport, Florida

Dear Mr. Harrell:

The U.S. Environmental Protection Agency (EPA) has received your letter dated March 13, 2007, requesting EPA to act as a cooperating agency in the preparation of an Environmental Impact Statement (EIS) for homeporting of additional surface ships at Naval Station (NAVSTA) Mayport, Florida. The U.S. Department of the Navy (Navy) proposes to homeport various types of surface ships, including the reassignment of operational staff, dependents, and other personnel to NAVSTA Mayport. Several of the alternatives being considered could involve a considerable amount of new work dredging. In particular, the Navy has requested EPA's cooperation and expertise to ensure adequate evaluation of the potential environmental effects from the actions of dredging and dredged material disposal.

EPA accepts the offer to be a cooperating agency for the proposed EIS, subject to resource limitations. EPA's cooperating agency status and level of involvement does not, however, preclude our independent review and comment responsibilities under Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, or our authorities under Section 404 of the Clean Water Act and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (MPRSA). Similarly, our being a cooperating agency should not imply that EPA will necessarily concur with all aspects of the Navy's EIS.

As a cooperating agency, we can offer early review and comment on EIS draft sections in areas of EPA mandates and expertise, as well as review of any Section 404/Section 10 permit work that may be required as a result of the proposed action. In addition, EPA Region 4 proposes to assist the Navy in development of the EIS in the following manner as suggested in your letter:

- Provide comments on working drafts of the EIS documents within 30 calendar days (every effort will be made to complete this task within 21 days as initially requested);
- Respond to other Navy requests for information;
- Participate in public meetings, as appropriate;

- Participate in selected meetings or teleconferences;
- Supply existing environmental information collected at and near the Jacksonville and Fernandina Beach Ocean Dredged Material Disposal Sites (ODMDSs);
- Assist in the development and/or review of any sampling plans for designation surveys that might be required;
- Provide guidance on the evaluation of ocean disposal alternatives with respect to the five general and eleven specific criteria should a new or modified ODMDS be needed (see further explanation in attachment); and
- Assist in the implementation of any needed baseline ODMDS studies utilizing EPA's Ocean Survey Vessel, based on availability and other contingencies.

EPA has not submitted formal scoping comments on the EIS. However, to further clarify our needs and potential role in the development of the EIS, attached are some comments for your consideration as you prepare the EIS. We appreciate your coordination with us and look forward to working with the Navy on this important project. The primary EPA contact for the overall EIS and NEPA-related issues will be Ben West at (404) 562-9643 in our NEPA Program Office. The EPA technical contact for dredging-related issues will be Chris McArthur at (404) 562-9391 in our Coastal Section.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosure

cc: U.S. Army Corps of Engineers – Jacksonville District

EPA Scoping Comments for the Environmental Impact Statement for Homeporting of Additional Surface Ships at Naval Station Mayport, Florida

Dredging and Dredged Material Disposal

Under the Marine Protection, Research, and Sanctuaries Act of 1972, EPA is responsible for the designation and management of Ocean Dredged Material Disposal Sites (ODMDSs) and is required to develop a Site Management and Monitoring Plan (SMMP) for each ODMDS and review and revise the SMMP every ten years. EPA in conjunction with the U.S. Army Corps of Engineers (USACE) Jacksonville District developed an SMMP in 1997 for the Jacksonville ODMDS that places an annual disposal volume limit (2 million cubic yards) on site use until a capacity study is completed.

EPA has concerns about disposal options for the large dredged material volumes that could result from the various homeporting alternatives. Therefore, EPA recommends that the EIS first evaluate multiple non-ocean disposal alternatives, including beneficial uses, followed by an assessment of the Jacksonville ODMDS. It is recommended that the Navy follow guidance provided in the Framework for Dredged Material Management (EPA Publication 842-B-92-008) in evaluating alternatives. EPA suggests that the Navy evaluate the extent to which the Jacksonville ODMDS can accommodate the dredged material from this project, including material from continued maintenance dredging, as well as the Jacksonville Harbor Project.

EPA and the USACE have already initiated data collection for such an evaluation and will continue to share this data with the Navy. Should the evaluation demonstrate sufficient capacity at the Jacksonville ODMDS for this and future maintenance projects, EPA will consider increasing the volume restrictions in the SMMP. Should there be insufficient capacity at the Jacksonville ODMDS, EPA suggests that the Navy consider as alternatives, at a minimum, an expansion of the Jacksonville ODMDS, use of the Fernandina Beach ODMDS, a new one-time use ODMDS for NAVSTA Mayport homeporting dredged material, or a new continuing use ODMDS for NAVSTA Mayport.

As stated above, it is EPA's responsibility to designate ODMDSs when needed. It is also EPA policy to review all ODMDS designation actions under EPA's Statement of Policy for Voluntary Preparation of NEPA Documents. If a new ODMDS is needed or an expansion of the existing Jacksonville ODMDS is needed, an appropriate NEPA document would be required as part of EPA's designation decision. The site designation process could be expedited if EPA could adopt the Navy's homeporting EIS or subsequent NEPA document. In order to do so, the document must adequately evaluate dredged material disposal alternatives and must address the five general and eleven specific criteria for site selection described in 40 CFR 228.5 and 40 CFR 228.6, respectively. Data from existing literature, field surveys, or model applications may be utilized in evaluating a potential site against these criteria. Particular emphasis should be given to the following issues:

1) Water Current and Dispersion Analysis. An assessment of the hydrologic regime at the proposed ODMDS, emphasizing those features that may cause movement of disposed sediments. These assessments should be performed utilizing current technology (e.g. current meter and wave sensor deployments) including numerical modeling as appropriate. The need for numerical modeling should be based on the physical aspects of the site, nature of the material proposed for

disposal, and significance and location of resources. This information should also be used to determine the appropriate size of the proposed ODMDS.

2) Material Proposed for Disposal. A description of the materials proposed for disposal including projected sources, quantity, physical-chemical properties, and results of material suitability surveys. To the extent practicable, the EIS should include projections for the next 10 to 25 years.

3) Historical Record of Disposal. If the proposed site has been used historically for the placement of dredged material, the EIS should include a record of the last five years of disposal activities, at a minimum, including quantity, material type, and date.

4) Existence of Hard/Live Bottom Habitats. Documentation of the existence of these resources should be included in the EIS. Summaries from video surveys and side scan sonar surveys are appropriate documentation for the existence and extent of hard/live bottom habitats.

5) Cultural Resources. Cultural resource surveys may include literature, magnetometer and side scan sonar, or diver surveys. All cultural resource results should be coordinated with the appropriate State Historic Preservation Officer.

Should there be a need for a new or modified ODMDS, it is recommended that the Navy utilize guidance in *Revised Procedural Guide for Designation Surveys of Ocean Dredged Material Disposal Sites* (USACE Technical Report D-90-8) and 40 CFR 228.13 to support collecting baseline data for comparison of ocean disposal alternatives. If EPA finds that the EIS does not adequately address the site selection criteria or that sufficient baseline studies are not completed, EPA will not be able to move forward with a new site designation.

Indirect Impacts

With regards to onshore environmental impacts, EPA recommends that the Navy thoroughly consider the direct, indirect and cumulative impacts of the various homeporting alternatives. It appears that there will likely be considerable differences between alternatives on the magnitude of infrastructure, maintenance, and other fleet support facilities and services that would be required to support the mix of ship types. These related support facilities and the indirect effects of the reassignment of operational forces, dependents and other personnel to NAVSTA Mayport could lead to significant environmental impacts in the areas of air emissions, traffic, noise, stormwater discharges, and wastewater management, depending on which alternative is selected. The EIS should fully analyze and consider these impacts.

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